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# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

ar | September 20, 1972 | Vol. VI No. 38


NEWSPAPER

## CW NEWS IN BRIEF

### FBI Evicts County Police From CCH Net

CINCINNATI, Ohio – The Hamilton County police network has been forced off the FBI's Computerized Criminal History (CCH) file because the county's Regional Computer Center is not strictly dedicated to criminal justice applications.

The FBI had granted Hamilton County an exception from this criterion [CW, Jan. 12], but upon review, the Policy Advisory Board decided to withdraw the interim clearance, according to the FBI.

The move eliminates Ohio's access to the CCH file, since the state's IBM 370/155 is not yet hooked into the system. County officials are seeking a reversal of this most recent change, and the FBI committee meets this week to evaluate the Hamilton County position.

An FBI official said the county had never gotten "off the ground" with its access to CCH, but the center Director Andrew Atkinson said this was incorrect, noting access was begun in March, and was terminated this summer "at the request of the FBI."

(see related story on page 6)

### Nobody Wants the Blame In N.Y. Rent Hike Squabble

NEW YORK – Landlords and city officials here continue to wrangle over rent increases, with the landlords blaming a faulty computer system and the city blaming sloppily prepared input forms.

The basis of the argument is a computer system used to compute the rent increases landlords would be allowed under city, state and federal guidelines.

The landlords charged recently that the city's "computerized rent increase program has collapsed."

The city said "not so." While admitting there have been delays with the system, the city blames most of the errors and delays on improperly filled out forms submitted by the landlords [CW, May 17].

### On the Inside This Week


**Codasyl Tries to Change 'Closed Group' Image** — *Page 15*

**Itel Boosts Disk Subsystem With Advanced Function Capability** — *Page 21*

**Leasing Companies Call IBM Price Increases Discriminatory** — *Page 33*

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## User Comments Invited

# Ansi Releases Cobol Standard Draft

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – A draft revision of the 1968 Cobol standard has just been completed by the American National Standard Institute (Ansi) technical committee X3J4. The public now has a chance to comment before Ansi's full X3 Computers and Information Processing Committee begins its formal consideration of the proposal.

The revision is available in two forms. The cutoff dates for comments differ somewhat but in either case users have until Dec. 1 to make their views known, according to X3J4 Chairman Robert Kearney of Bell Labs.

**Major Revision**

The proposal, described as a major revision of the old standard, includes a number of technical changes – deletions and additions, as well as editorial and format revisions to improve readability.

Under the new plan, there will be a nucleus and 11 functional processing modules in the complete ANS Cobol, rather than the nucleus and eight modules that make up the old standard.

The old random access module has been completely replaced by two new modules: Relative I/O and Indexed I/O. Additional facilities are provided by three new modules dealing with debugging, interprogram communication and communication between a program and its users.

The Report Writer module is part of the proposed standard and has been completely rewritten to remove ambiguities and to provide a stronger and more useful facility.

Major changes introduced into the Nucleus include, according to Kearney, the deletion of the REMARKS paragraph and the NOTE statement, in favor of a generalized comment facility similar to that used in other languages, with an asterisk as an identifier.

The EXAMINE statement has been replaced by a more powerful INSPECT statement. The GIVING and other identifier series (a new feature, themselves), have been added to the arithmetic statements; the BY identifier series has also been added to COMPUTE and the INTO identifier series has been added to the DIVIDE statement.

The STRING and UNSTRING statements have been added to permit the effective manipulation of partial or complete contents of two or more data items within a single data field.

Punctuation rules have been relaxed and the new standard is expected to be more forgiving with respect to the presence or absence of spaces around commas, parentheses and the like.

Changes in the Table Handling module include the requirement that the subject of the condition in the WHEN phrase of the SEARCH ALL statement must be a data item named in the KEY clause of the referenced table. The object of this condition may not be such a data item, Kearney said.

In the existing standard, either the subject or the object could be a data item named in the KEY clause, he noted.

The Sequential I/O module contains the language elements necessary for the definition and access of sequentially organized external files. Changes in this area include the deletion of the SEEK statement which X3J4 considered redundant and ineffective.

OPEN REVERSED now positions a file at its end, and OPEN EXTEND has been added to permit the addition of records at the end of an existing sequential file.

*(Continued on Page 4)*

# Despite Problems 3 Users Plan to Stay With OS/VSI

By a CW Staff Writer

San Diego Gas and Electric Co. had severe problems with Customer Information Control System (CICS) response time; Sangamo Electric couldn't get two partitions operating simultaneously; and McDonnell Douglas Aircraft became more aware of the need for efficient programming that wouldn't overburden the paging system.

All three of these 370/145 users were field-test sites for IBM's OS/VS1 during the spring and early summer, and each had some problems. But all three have decided to use the new virtual memory system as their production environment.

Adapting an ongoing production shop to OS/VS1 required no programming changes in any of the three sites. Jobs that had been running under OS/MFT were used "as is," without recompilations or any other modification.

San Diego Gas appeared to have the worse problems in the switchover period, and the degradation of response time under CICS was the worst of the problems. But, ironically, it now seems that response times were so bad because CICS wasn't being used enough.

The California utility has a 256K 370/145, with three 2319s and eight Memorex 660 disk drives, along with a number of Sanders 720 terminals.

Twenty-four of these units were being used for CICS-based inquiries, and during the test there were only five to 10 "hits" per minute against the data base.

Used in a real memory environment, CICS responded to this much activity typically in one to three seconds. Under OS/VS1, the response time went up to 10 to 12 sec/inquiry, according to the company, since CICS was paged out of the system between uses and had to be brought back as each inquiry was received.

A parameter that allows the user to define certain pages as core-resident may solve the problem, a company spokesman said. On the other hand, increased usage, with order entry starting in January 1973, may also give it enough work so the pages will stay in core without the parameter.

Aside from the very real CICS problems, San Diego Gas has been very pleased with the virtual system. The company's engineers are doing work that couldn't have been handled in the real memory environment.

Throughput on all production jobs is expected to be 10% to 15% better than under the single 140K partition the company had on the "real" machine.

The operations people had more problems than the programmers. San Diego at

*(Continued on Page 2)*

# 'Known Criminals' in Data Bank Also Include Those Not Convicted

By Michael D. Sorkin
Special to Computerworld

DES MOINES, Iowa – Des Moines police have kept secret computerized intelligence files on "persons of interest" for more than a year, and although some of the suspects have never been convicted of any crime whatsoever, the reports label the individuals as "known criminals."

The 800 to 900 persons listed in the intelligence files are described as "known militant," "known burglar," "known sex offender," "known narcotics pusher" or other types of criminal.

The descriptions – often based on unverified information – could be made available to lawmen throughout Iowa and police, FBI agents and other officials across the country upon request.

**'Reliable' Informants**

Decisions on how to label intelligence suspects are made by members of the Des Moines police intelligence unit. Their conclusions are based upon information supplied by other policemen in the field, from paid "reliable" informants, from yet-uncompleted police investigations and from data gleaned from prosecutions of arrested persons who have gone to trial.

"The intelligence officer takes this information, evaluates it and then decides whether a certain individual is of interest to the police," explained John Jones, a member of the police department's research and development division.

The data is then summarized for placement in the computer used by Des Moines area peace officers. The system is called Law Enforcement Network Central Iowa Region (Lencir).

"Regular law-abiding citizens have no need to fear the information in the computer," Jones said. Information generally is kept only on 'low-life' persons who police believe are "active criminals," he added.

*(Continued on Page 2)*

# Some 'Known Criminals' Have Not Been Convicted

*(Continued from Page 1)*

Someone who is a well-to-do Des Moines "blue blood" who has never been in trouble with the law will certainly not be included in police intelligence files, Jones said.

### Arrest, No Conviction

On the other hand, someone who has been arrested six times for burglary but never convicted "would probably be listed as a known burglar," said Jones whose job gives him planning responsibility over the computer.

Another example is listed by Jones: "Somebody might have been arrested and then not convicted in court because of some technicality." Such a person would have a police intelligence file "because we know he's guilty," Jones said.

Persons classified as "known militants" might include Black Panthers or Weathermen, according to Jones. "Somebody wouldn't be included just because he marched in a peace parade. He would have to do something else, too."

Jones was asked whether labeling someone as a "known criminal" when the individual has never been convicted of a crime isn't a violation of individual rights. Jones replied: "He doesn't care. He's probably just thankful that he's never been convicted."

The police computer intelligence file has been in use since the spring of 1971. Its existence only became known within the last few weeks.

Jones asserted the intelligence file is an important police tool. Its main value, he said, is in ensuring the safety of police officers, who can radio a request for information from their patrol cars to the police dispatcher.

The intelligence file enables officers to pinpoint within seconds the addresses of the "known troublemakers" in a given city block, police said. "The man in the field needs to know right away the background of the person he's dealing with," Jones added.

### Sensitive Data

Police, however, regard the information in the intelligence files to be so sensitive that they refuse to read data over the radio. Instead, a policeman who requests information must make a telephone call in order to receive it.

Police will not allow an individual to inspect his own file, unless he can obtain a court order, officials noted.

Des Moines Police Chief Wendell Nichols gives this description of the intelligence file: "This file is not an arrest file, but should specifically be used to identify those subjects who are potential felony offenders." Jones said some "police contact" with an individual is required before an individual is listed in the intelligence file.

The 800 to 900 names in the intelligence file actually comprise only a small portion of the Lencir data banks. Other, far larger files are kept on wanted persons, stolen property, persons with traffic offenses and such individuals as runaways and missing persons.

### More Queries Needed

Last year, shortly after operation of the computer started, Lencir officials complained that other police weren't using the computer frequently enough. In a letter sent to the nine central Iowa police departments using the computer, officials were told to query Lencir whenever they had any contact with anyone.

"If your departments could make a practice of routinely inquiring on as many persons and vehicles (as) officers come in contact with, it would be beneficial to the system".

State officials acknowledge that intelligence data from Des Moines' Lencir could be made available to other peace officers throughout Iowa via the communications network designed to serve the statewide police crime computer called Tracis. Lencir also is connected to the FBI's National Crime Information Center.

Iowa Gov. Robert Ray recently ruled that Lencir may not be interfaced with Tracis until all of the Lencir intelligence data has been purged. Ray also has directed a legislative committee to develop privacy safeguards for the state's crime computers.

Des Moines City Manager Tom Chenoweth said he sees nothing wrong with describing people as "known criminals" even though they have never been convicted of a crime. "We all know of people who are criminals who have never been convicted of anything," Chenoweth said.

Chenoweth acknowledged there is no effective civilian control over how police use their computer or what kinds of information they put into it, and he feels this is how it should be.

"The police are working for my welfare," Chenoweth said. "I don't want to go around telling them how to do their job. You just have to train the men and pray that they do the right thing."

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Second-class postage paid at Boston, Mass. and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington Street, Newton, Mass. 02160. © 1972 by Computerworld, Inc.

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# Users Have Problems, But to Stay With OS/VSI

*(Continued from Page 1)*

first put "everything" for the control system on one disk drive and the arm contention that brought on "darn near caused the thing to walk out the door," according to the company spokesman. A better distribution across several disk packs solved that problem, he added.

In any case, the utility has had good enough experience with the new software so it has put back for at least a year a 256K addition to the 145 it had planned to install last June.

Sangamo Electric had the smallest 145 used in the field tests, with only 160K bytes of real memory. This was too small for effective use and for some reasons not yet clear, it could not support more than one partition at a time.

The 160K real memory configuration would, however, respond to priority jobs in a second partition, but it did this by "knocking the first job off the air," Sangamo said.

The company expects to get around this problem by moving up to 208K bytes of real memory, but a spokesman indicated the firm might well use OS/VS1 even if it wasn't expanding storage.

The programs now being run had outgrown the 80K partition on the real memory; now there are two virtual partitions of 192K bytes apiece.

Beyond that, the company gave high marks to the spooler built into the new control system. The "hot reader" feature avoids the previous need to knock down one of the functioning partitions in order to get input.

In addition, the print spooler allows a job to be interrupted for priority work, then resumed. That simply couldn't be done under standard OS, the company said.

McDonnell Douglas Aircraft was another test site with 256K bytes of real memory, with an integrated file adapter (IFA) and six modules of 2319 disk space. Unlike the other users, its applications are heavily engineering-oriented, in Fortran and assembler.

The company found it difficult to get specific measurements of performance, because the job mix changed from day to day, but it appeared that "wall clock" throughput was faster on the average job than under standard OS.

Having generated a 2M-byte virtual storage, the company structured this into two, and now three, 256K partitions, another of 196K bytes for "hot jobs" and still another of 64K bytes to receive input from an IBM 1050-type teleprocessing operation.

With that organization, the OS/VS1 was rated as a "good replacement for OS/MFT" by a company spokesman. He noted, however, that the apparent freedom from concern over core requirements was not the same thing as an excuse for sloppy programming.

Programs still have to be efficiently written and then tuned to avoid excessive paging operations. This doesn't mean that programmers must write their code constantly concerned for the 2K-byte page size, but it might cause reconsideration of such techniques as binary searches that exceed page limits, the spokesman suggested.

All three of the test sites said generation of the system was comparable to or easier than "genning" of a new OS release, but lack of familiarity with some of the new facilities might cause some initial confusion for the systems programmer.

Distribution of the system libraries to avoid useless thrashing of overworked disk drives would be another problem in tuning the system for particular installations needs, they agreed.

But overall, all started using the new software four hours a day, as requested by IBM for the test, and now all three sites are using OS/VS1 24 hours a day as their standard mode of operation.

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## Bill Focuses on Social Issues

# DP to Play Major Role in National Priorities Plan

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Data processing systems will be employed in the effort to revise national priorities under a bill recently passed by the Senate.

The measure (S. 5) would establish a Council of Social Advisers similar to the Council of Economic Advisers to collect and analyze information on social issues facing the nation.

The council, which under the act would use computers in its task, would "gather timely and authoritative information and statistical data concerning developments and programs" designed to "encourage such conditions as will give every American the opportunity to live in decency and dignity, and to provide a clear and precise picture of whether such conditions are promoted and encouraged in such areas as health, education and training, rehabilitation, housing, vocational opportunities, the arts and humanities and special assistance for the mentally ill and retarded."

### The Need

Presently, the Congress and the Executive often devise programs "based on myth and ignorance or guess and supposition, according to Sen. Walter Mondale (D-Minn.) in debate on the bill.

"Congress is now," he added, "groping with the problem of welfare reform, but it is painfully evident that we lack some of the basic information which we need in order to design a system in which we could all have confidence.

"Similar problems are presented with respect to urban renewal, mass transportation, air and water pollution and health delivery systems. In practically every major social problem of this country, it is not only a question of resources; it is not only a question of will; often it is simply a question of the unavailability of the information we need with which to deal effectively with the problem."

"We are still quite ill-equipped, he noted, to measure what our existing programs do accomplish. And we have no adequate means to compare the costs and effectiveness of alternative programs."

As part of the solution, he said, the new Council of Social Advisers would "take full advantage of the latest developments in planning, programming and budgeting systems, in computerized data collection and statistical methodology, in systems analysis and social accounting."

Using these techniques, Mondale predicted that the council could "unlock the enormous potential of the social sciences to assist the Congress and the Executive in developing and administering public policy."

In addition to establishing a Council of Social Advisers reporting to the President, the act would establish a congressional office that would analyze the data supplied by the council and provide the Congress with an analysis to aid it in voting on the measures and appropriations and to give it an overview of the effect of each action on the overall program of social priorities.

This office is needed, Mondale said, "to equip Congress with the kind of skills and talents in analysis, statistics and computer technology that I think we need to be able to meet the enormous distortions of the Executive Branch, no matter what party is in control.

"I get all the computer printouts, data and knowledge that I could possibly want," he added.

"But, strangely, when one finds himself in opposition to the Executive, under either political party, suddenly the computers go dead, they run backwards, the data they give you is somehow incomplete. Why Congress should voluntarily deny itself the information and data it needs to make intelligent choices under these circumstances, I do not know.

"Sometimes," Mondale added, "I think we have a new axiom – that he who controls the computers wins the debate."

In conclusion, Mondale noted that the proposed Council of Social Advisers "would not itself be a new decision-making forum. Rather as a social-monitoring data-gathering, and program-evaluation agency, it would provide the President and his staff agencies with much of the information needed to make policy and program judgments.

"The Council of Social Advisers would fill a significant gap in the information systems which is needed to buttress the policy-making apparatus under the President," he added.

## Accident Car 'Hit'

SOMERS, Conn. – A computer played a role in the location of a suspected hit-and-run driver here recently.

Police said the car believed to have been in an accident involving two fatalities was identified as a 1970 American Motors Hornet.

A state computer check was run to find local owners of this model. Later a car suspected of being involved was found in a body shop in Stafford, a neighboring town, and the owner was arrested.


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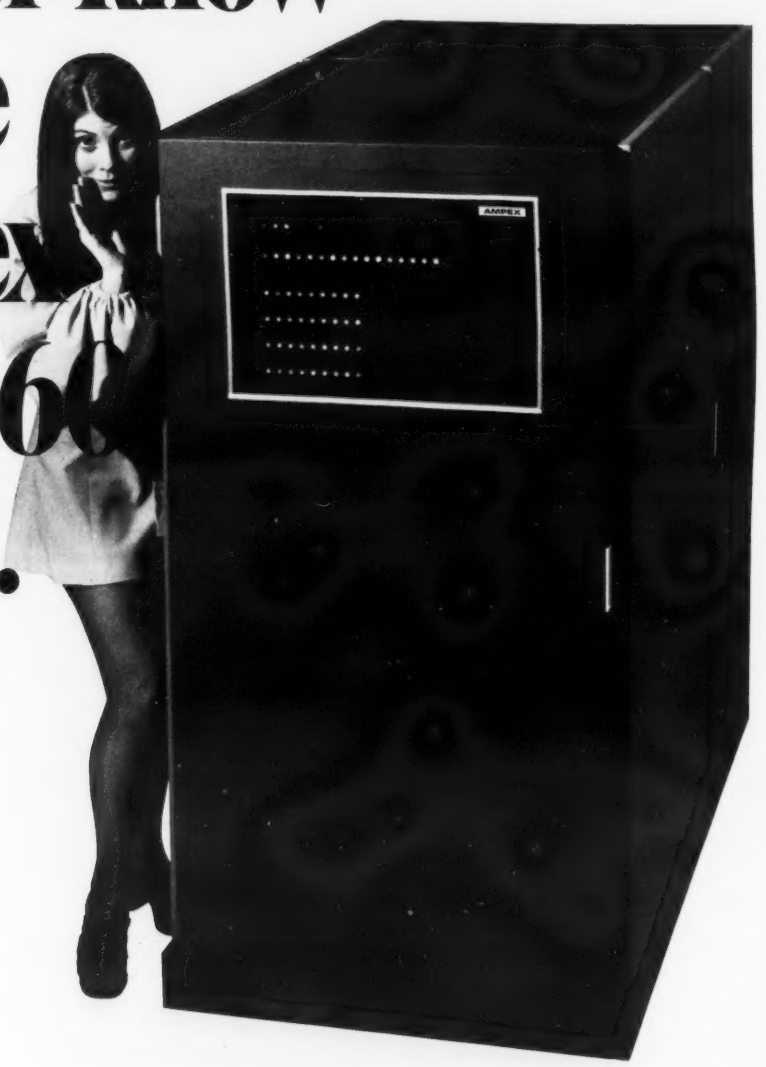


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## How to Succeed in MIS

# 'Identify With Company'

By Edward J. Bride
Of the CW Staff

MONTREAL – The best way to succeed in managing systems people is to educate them "to identify with the company, and not with the profession," according to Michael J. Samek, director of management services for the Celanese Corp.

Computer people must "stop building systems for systems' sake," Samek told some 200 users at the annual meeting of the Society for Management Information Systems (SMIS).

Semek said the failures in MIS are "far more often" caused by organizational, and not technical inadequacies. While designing systems is difficult, "the building of systems is no longer a problem," he commented.

The answer to the building of good systems, he continued, is to make "systems professionals" part of the management team.

"There is no reason why a systems professional should be eliminated from the ranks of management," he said, adding a systems person could broaden his horizon without losing his profession.

Samek's remarks, made at the fourth annual SMIS conference here recently, reflected the general attitude of most speakers, he noted.

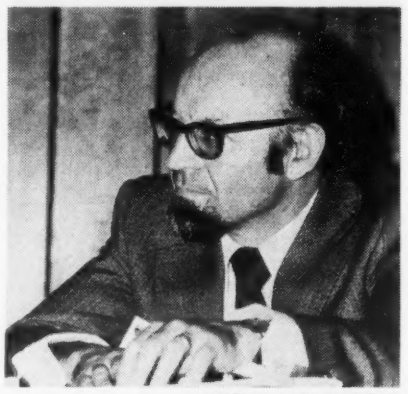
SMIS President Dr. James C. Emery said there are many examples of "formal, integrated systems," and that the main problem with this aspect of computer use is that "those doing useful things don't always have the time to sit down and tell us."

Paul J. Dixon, conference chairman, criticized the "simplistic and naive" view that "lack of management involvement" is the main problem facing MIS users.

The various management processes performed by the divisions in a large company are not homogeneous, though they are interconnected, Dixon commented.

The problem is not in getting top-level managers to talk to each other, but to examine information needs at every level of a company. If a system "doesn't work for a foreman on the assembly line, it doesn't work at all," Dixon stated.

Samek agreed, stating "it is a fallacy" to



CW Photos by Edward J. Bride
**Samek**
**". . . no systems for systems' sake"**

expect top managers to get involved in the "nitty-gritty of systems design." Management must know how MIS is to fit the company, how it can contribute to corporate goals.

But explaining MIS failures as stemming from lack of management involvement "is a cop-out on our part," he said, adding this is why systems people must be made part of the management team.

MIS will not help organize a company that is disorganized or unsuccessful, he added. "There is no way you can superimpose a successful system" onto such a company, he related.

Dixon, on the other hand, noted companies use MIS at different levels, and therefore different types of MIS need to be developed. A planning and control system may be cheaper to create than a sophisticated system, but it also may be more difficult to get top management's acceptance of this system, he said.

An attendee asked how all these ideas might be passed on to other users, so the growing pains of learning MIS could be diminished.

Dixon and Emery both had possible answers. For Dixon, "maybe everyone in this room should volunteer to guest-lecture in the local university" upon returning home.

Emery said a "body of theory" was needed, and that the society should have as its goal the formulation of this body of knowledge.

Michael J. McCracken, consultant to the governments of the U.S. and Canada, listed some of the lessons he had learned in helping develop one MIS with some 1,600 equations.

The first factor was similar to Samek's "identity" suggestion: have a framework or a theory of the company's goals and corporate makeup, to aid in building a model.

Secondly, "data must be checked, no matter how sophisticated the computer system," McCracken said.

Finally, feedback is essential, McCracken added. A user and/or developer must know the faults of a system if it is to be improved.

McCracken also took issue with a comment on the uselessness of "stale data," which he said was extremely useful in helping build systems.

# Fire Guts IBM Data Center

By a CW Staff Writer

**HAWTHORNE, N.Y. – A data center housing millions of dollars worth of operating computers was gutted by fire here last week, despite the fact that it had passed local fire regulations.**

**Firefighters reportedly took nine hours to extinguish the blaze at IBM's Program Information Department (PID), which was responsible for duplicating and disseminating new and updated programs, as well as new releases of IBM system software.**

**Destruction of the center means that this software, including some virtual storage items, may be delayed, IBM acknowledged.**

**While the building had no sprinkler system, a $CO_2$ system was installed in a tape vault, and it did discharge, resulting in "minimal loss" to tapes, IBM also said.**

**Equipment damaged or destroyed included: two 360/50s, three System 3s, an 1130 and a 360/20.**

**The backup to the destroyed software is in the form of master programs, retained at the individual development centers, IBM noted. These will be sent to Mahwah, N.J., where a temporary facility will be established, IBM added.**

**All IBM customers awaiting program products emanating from the facility were informed of possible delays, with the notification process starting only hours after the blaze was extinguished, IBM said.**

**The fire started in a basement storage area and spread to the rest of the building, damaging perhaps three-fourths of it, according to Fire Chief Russel Rizzo.**

**Because punch cards were stored in tight bundles, Rizzo said, the water did not extinguish the blaze, and foam up to four feet deep had to be used.**

**Rizzo also said he never saw a sprinkler system in the building, which he had previously inspected and passed.**

**A police detective assigned to an investigation did not rule out arson, and said that with a "fire of this magnitude," an initial investigation is always made.**

**Rizzo said there was a nearby brook available for firefighting, however. The 1,400 to 1,600 feet of hose laid to the nearest hydrant was not considered excessive, he added.**

# Welfare System Makes Hit in Mass.

By a CW Staff Writer

BOSTON – Massachusetts has finally gotten its often-criticized welfare computer system into operation and its debut was remarkably successful, uncovering more than 3,000 cases of duplicate payments in a two-week trial.

The first phase of the project – a master file of recipients – has allowed the state to check every recipient in the state for cases of duplicate payments "for the first time in history," according to Governor Francis Sargent.

While a master list of recipients is a feature of many other welfare systems presently in use, getting the system operational in Massachusetts has been difficult ever since the state centralized its welfare operation four years ago.

### Severely Criticized

The computer-based system, built around an IBM 360/40, was severely criticized last year in a report of the state legislature which charged the Welfare Department with "floundering" in its computer efforts and noted that "over $428,000 had been spent for consultant services for a data processing system that was essentially non-existent."

But the system is now at least partially in operation, with later plans calling for adding vendor payments to the system and using the system to keep lists of people eligible for Medicaid payments.

Of the 3,000 duplicate records uncovered in the two-week test, Sargent noted that not all of the double payments were fraudulent, because an individual can receive payments in more than one category at the same time.

But, he added, the cost of the system was "absolutely justified" in that it would allow the Welfare Department to tighten its eligibility requirements and to catch fraudulent duplications.

Welfare Commissioner Steven Minter estimated that overpayments to 28 recipients already investigated had been costing the state as much as $4,000/mo.

# Ansi Committee Releases Cobol Standard Draft

*(Continued from Page 1)*

The AT END phrase of the READ statement was made optional under the draft proposal. It must appear, however, if no applicable USE procedure appears, an X3J4 source indicated.

While there is much functional and even syntactical similarity between the Relative I/O module and the Random Access module of the 1968 standard, the Indexed I/O module has no functional equivalent in the existing ANS Cobol. This new module provides a capability to access records of a mass storage file in either a random or sequential manner.

Each record in an indexed file is uniquely identified by the value of one or more keys within that record. As with the Relative I/O module, the new verbs DELETE, START and REWRITE are available for indexed records.

READ NEXT and READ . . . KEY IS . . . are also available, X3J4 said, explaining that the latter provides the means of specifying the key upon which retrieval is to be based.

The Debug module provides a means by which the programmer can specify a debugging algorithm, including the conditions under which data items or procedures are to be monitored during program execution.

An object time "switch" is also provided, outside of the Cobol program, through which the USE FOR DEBUGGING procedure can be effectively turned off without having to recompile the program.

Under the Interprogram Communication module, a program can communicate with one or more other programs. This includes the ability to transfer control from one program to another within a run unit and the ability for both programs to have access to the same data items.

The Communications module provides the ability to access, process and create messages or portions of them. It includes the specification of an interface area between the message control system and the Cobol program, and the availability of a number of statements appropriate to message-handling situations.

A summary of the draft revision is contained in X3J4's Cobol Information Bulletin #16 and a descriptive cover letter by Kearney. Completed in July, comments on CIB #16 are expected by Dec. 1.

X3 has authorized publication of a complete draft of the revision. Currently at the printers, this 500-odd page document is expected to be available shortly, for $6. Comment cut-off date on this version of the draft proposal is Dec. 31.

Copies of CIB #16 and the complete draft revision can be ordered through X3 Secretary Robert Brown, at Business Equipment Manufacturer's Association (Bema), 1828 L. Street N.W., 20036.

| | Functional Processing Modules | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nucleus | *Table Handling | Sequential I-O | †Relative I-O | †Indexed I-O | Sort-Merge | *Report Writer | Segmentation | Library | +Debug | +Inter-Program Communication | +Communication |
| Level 2 | Level 2 | Level 2 | Level 2 | Level 2 | Level 2 | Level 1 | Level 2 | Level 2 | Level 2 | Level 2 | Level 2 |
| Level 1 | Level 1 | Level 1 | Level 1 | Level 1 | Level 1 | null | Level 1 | Level 1 | Level 1 | Level 1 | Level 1 |
| | | | null | null | null | | null | null | null | null | null |

**"Structural" changes include (*) two instead of three levels, (†) two modules instead of one and (+) completely new modules.**

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## The Case of the Homeless TTY

DUBLIN, Ga. – "Try it, you'll like it."

That was the message apparently given to the police department here by the Law Enforcement Assistance Administration and Burroughs Corp. which delivered an unordered teletypewriter to the agency.

The department asked LEAA if it would be eligible for such equipment and if it was available, but did not request it. But the teletypewriter was delivered to police headquarters by Burroughs.

The department tried to explain that it had not decided whether it could afford the system, and asked Burroughs to remove it. But Burroughs and LEAA told Chief Vernon De Loach to try the system – since it was already there – and to consider the benefits it could get by hooking in with the FBI's National Crime Information Center.

But even with an LEAA promise for some help in funding some of the cost of the system, the city has still not decided whether it can afford the additional costs involved.

So the machine still sits outside the police department here, untried, waiting for someone to come and take it away.

# Letter Protests Systems Dedicated Completely to Law Enforcement Uses

By a CW Staff Writer

WASHINGTON, D.C. – The White House has received a letter sharply criticizing legislation which would require the complete dedication of criminal justice computers to law enforcement agencies.

There is legislation pending in both houses of Congress, requiring computers receiving federal law enforcement grants to be staffed by and used for law enforcement purposes only, complained Richard J. Kohrman, president of Government Management Information Sciences (Gmis).

### Reduce Government Use

He wrote to President Nixon that such dedication would reduce the use of computers by state and local governments, which could not afford computers without federal assistance.

The legislation is intended to preserve the confidentiality of criminal justice information, Kohrman acknowledged. But he said current policies of the FBI and other computer users in the criminal justice process can protect sensitive information.

Furthermore, the operation of entirely separate systems would be an "economic impossibility" for many Gmis members, he said.

"We must remove any question that federal grants for law enforcement use of computers be based on exclusive law enforcement applications," he said.

### Some Agencies Exempt

A staff assistant to the President, Jeffrey Shepard, answered Kohrman's letter and noted the attorney general would have the authority to exempt agencies if other means could be implemented to protect security and privacy.

Kohrman said he was aware of this provision, but there should be guidelines established for such exemptions. While Shepard's chief argument – that the surest way to assure security was with dedicated systems – went uncontested, Kohrman said his letter was intended to highlight the alternative presented by system sharing.

Gmis consists of state and local government computer users, and is similar in purpose to the National Association for State Information Systems (Nasis). Kohrman said Gmis officials expect to meet soon with Nasis officials, but he did not specify whether any "merger" of efforts was being contemplated.

### Sharing Not New

Sharing would not be a new concept for Gmis, which held shared sessions during a recent conference in San Francisco, the other group being the Urban Regional Information Systems Association (Urisa).

The chief difference between these two groups, apparently, is that Gmis precludes federal government and consultant-type memberships, while Urisa does not.

Kohrman sent his letter to the President in June, but did not receive the White House reply until this month, after he returned from the Gmis meeting.

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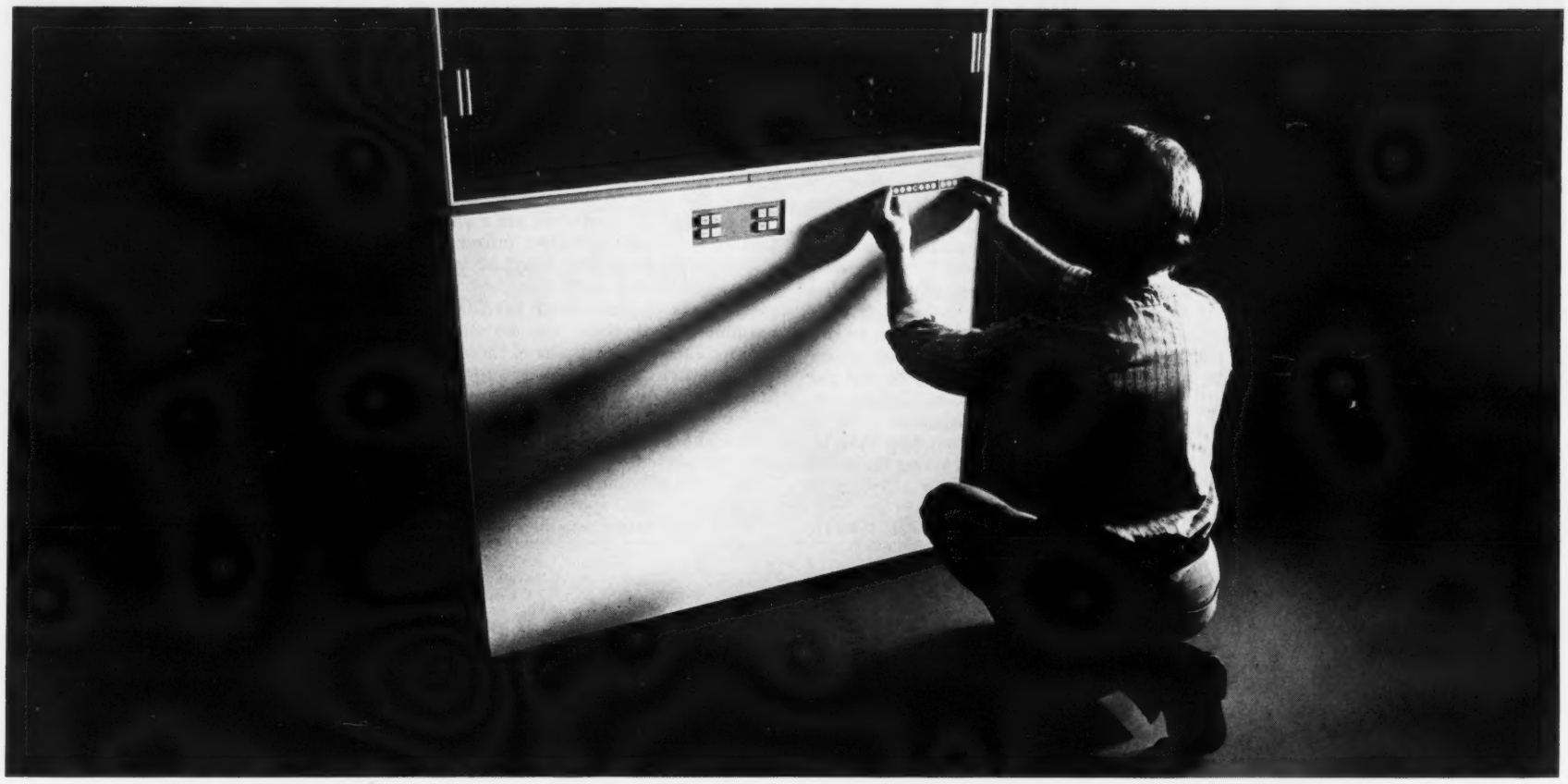

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## State Gathers Inmate Backgrounds

# No Additional Security Planned for Convict Data Bank

By E. Drake Lundell Jr.
Of the CW Staff

COLUMBUS, Ohio – Corrections department officials here are planning to put personal information on the state's 9,600 convicts in a computerized data bank without any major security measures other than those used in the state's manual system.

The system, to be implemented under a $450,000 grant from the Law Enforcement Assistance Administration, will include information such as the results of psychological tests, education, police records, social backgrounds and medical histories on all convicts within the system.

"We haven't really instituted any additional security measures," an official with the Department of Rehabilitation and Correction said.

He said the system would have terminals in all of the system's eight major prison facilities. A user would have to know an identifying number in order to access the system.

### No Additional Security

Since the people using the system will all be officials with access to some of the manual files (wardens, parole officers, etc.) a department official said no further security requirements would be needed, even if the officials will have access to much more information once the system is on-line.

The system will be based around an IBM 370 computer in the state finance department, officials said, and may be tied into a statewide management information system now under development.

It appears other officials tied into the statewide network could access the prison data base if they knew the proper code for the prison data base.

In such a case it would be hard to tell whether anyone had accessed the information.

### What Information?

"All of the information we can possibly gather on an inmate" will be put into the system, according to a corrections official.

"Presently," he said, "we are trying to find how to put subjective information into the system so that it will be valid."

For example, he said, it might be hard to compare the results of psychiatrists' examinations if there was no standard way for entering the results of those tests.

The system will also keep up-to-date information on a prisoner's conduct in prison – such items as reprimands received and in how many prisons the prisoner has served.

The system is intended to provide the department with statistical information such as how many prisoners have a high school education, how many have served time before and how many have arrest records for other violations.

It will also be used to aid the parole department in determining what prisoners would be good risks for probation or parole.

It could also help determine what types of rehabilitation programs should be established to provide the greatest good for the greatest number of prisoners, a corrections official said.

The software for the system will be ready in seven to eight months, with the entire system operational in 18 months, the officials said.

## Bill Aims to Expand, Coordinate Research In Lung, Blood Ills

WASHINGTON, D.C. – Research in the role computers can play in the fight against heart and lung disease will be bolstered by a new bill passed recently by the House and Senate.

Under the National Heart, Blood Vessel, Lung and Blood Act of 1972, a new program would be initiated in the National Heart and Lung Institute to "expand, intensify and coordinate" research into such diseases.

### Major Role

One of the major roles of the new program would be "research into the development, trial and evaluation of techniques, drugs and devices (including computers) used in, and approaches to, the diagnosis, treatment and prevention of heart, blood vessel, lung and blood diseases and the rehabilitation of patients suffering from such diseases," according to the bill.

In addition, the measure calls for the "education and training of scientists and clinicians in fields and specialities (including computer sciences) requisite to the conduct of programs respecting heart, blood vessel, lung and blood diseases."

The measure is needed, according to Rep. Harley O. Staggers (D-W.Va.) because there are more than 26 million Americans afflicted with some form of heart disease and another 20 million "disabled" with lung disease. The deaths from heart disease amount to over one million a year, he added.

Computers and computer techniques are specifically singled out in the bill for further research because they have "contributed to more skillful diagnostic techniques" in the past and could be an even greater help in the future, according to the bill's sponsors.

### 15 New Centers

In addition to establishing the new program in the National Heart and Lung Institute (a part of the National Institutes of Health), the bill calls for the establishment of 15 new centers for "basic and clinical research into, training in, and demonstration of, advanced diagnostic, prevention and treatment methods for heart, blood vessel and blood diseases."

It would also establish another 15 centers for research specifically aimed at lung diseases.

All of the new centers could receive up to $5 million a year for their operations, according to the bill.

## Post-Surgery Patients Aided

BIRMINGHAM, Ala. – The University of Alabama Medical Center is using a computer to help care for patients in the critical hours after open heart surgery.

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## Editorial

### The Shifty Shuffle

"A new practice is sweeping the country," writes Burton Hillis in the September *Better Homes and Gardens*. "I call it the Shifty Shuffle, but it's neither game nor dance.

"You see it when a company makes a mistake and attributes it to their computer, brushing off your complaint and ignoring the fact that computers only work from human instructions."

Hillis' comment comes almost a year after the *Afips-Time* national survey revealed that 24% of the adult population had had problems getting a computer-prepared bill corrected.

Apparently despite this year-old warning, all too many companies still have not set up adequate procedures for handling customer complaints.

## A Call for Help

# DP for Dentists Underdeveloped

By W.A. Riggert
Special to Computerworld

In a recent issue [CW, June, 28], an article appeared by a practicing psychiatrist – Dr. Mikuriya – explaining the need for data processing equipment and techniques by professional offices. A practicing dentist has a slightly different viewpoint, however. As in so many other aspects of data processing, relief from the daily paperwork problems seems to be "just around the corner."

Today, the professional offices are feeling the same pressures that all other segments of the business community feel. This includes increases in material costs as well as in wages and fringe benefits. Dentists can't do much about material costs except control inventories.

In the area of labor, however, dentists must be able to make their working hours do the most good, and this is where DP can significantly help.

In other segments of the business community problems can usually be met by internal analysis (providing the company is large enough to absorb the cost), by grouped organizations (such as the national chains) or by software houses serving individual businesses. However, to the small professional offices, these methods are not practical.

A large number of professional offices is presently utilizing the peg-board type of accounting and information gathering system. Although there is a large number of "automated systems," they essentially do nothing more than rely on peg-board information gathered manually to produce billings and a limited number of accounting reports – "automatically."

**Viewpoint**

Still another variation of this half-hearted approach to office information involves using an input device (such as KSR 33s and CRTs) to feed a time-share system. Does this approach solve the problem? It does not, since the problem is not so much in processing collected data, but in the actual collection of raw data.

There is another, more significant factor which has not been approached – that of supplying specific information to insurance companies and receiving information and payment from them. This presently represents millions of dollars in a nationwide accounts receivable float. As long as this float has a rapid turnaround time (three to six weeks) the financial situation is manageable in the professional offices.

However, doctors are experiencing delays of six months to a year – and in isolated cases much longer – and these delays are not tolerable. In considering processing of data, the information transfer as well as other internal problems must also be considered.

These conditions must be coupled to a situation unique to the health professions – namely the transfer of health care data between offices in a very secure system. If an individual tries to recount specifically all of the medical and dental therapy as well as all the medication he has received, the difficulty of the problem is apparent.

With the technology presently available there is no excuse for incomplete patient histories being utilized to determine proper treatment for a specific ailment.

Unfortunately, the DP industry has made few attempts to help solve this situation.

At the same time it must be admitted that the health professions have made only weak calls for help.

Considering the number of private offices related to the health professions throughout the country, a manufacturer should find a lucrative field to develop. This is especially so since the problems of the various types of offices are nearly identical.

I'm throwing out a challenge to the people in the DP industry as well as those in the health professions interested in beginning to solve these dilemmas.

*W.A. Riggert is a practicing dentist and has been involved in macro information system design and research in data-handling techniques at the University of Detroit Dental School. He has also worked on systems and procedures at Chrysler Corp.*

## Letters to the Editor

### Hotel Management Information Requested

As a result of declining profits and increased complexity of control and operations, hotel managers are beginning to realize only computers can provide solutions to some of the problems facing them.

Currently, a few hardware and software companies offer a limited range of computer hotel systems, both for back office and for front desk applications. I am currently compiling a survey on the use of computers in hotels as part of my Master's thesis. I would like to hear from anyone having information relating to the use of computers in hotel management and accounting systems, or anyone interested in the subject.

David J. Rubin
Sloan School of Management
50 Memorial Drive
Cambridge, Mass. 02139

### Civilian Data Needs Protection Also

*Computerworld* is to be commended for its stand on individual privacy in these days of proposed universal computerized data banks.

The armed forces, while they continue to gather data on law-abiding citizens, ridicule the idea that information can be gleaned from data files by the clever application of set theory. Meanwhile, I've learned they take that concept seriously where information, however innocuous, about themselves is concerned.

In order to prevent anyone from obtaining data that was once written on a disk file, they burn the disk pack. They worry, it seems, that the residual magnetism from data originally on the pack remains even after conventional overwriting or erasure.

Surely the Pentagon knows that if information is in the system, someone can figure a way to extract it. Thus, I'm sure that no top secrets are processed. However, the military also knows that correlations of seemingly unrelated data can be used to learn a very great deal that was not originally reported in any of the data.

The Pentagon, though, seems to feel that this very natural fact applies only to military data, not to data on civilians. I think it's time we insist, through our elected representatives, that the Pentagon stop having things two ways at once.

Dan Tanner
Lindenwold, N.J.

### Explain Delays!

Your "Public Interface" editorial [CW, Aug 23] does not do justice to the system design of the Wizard of Avis. Worse than that, it is irresponsible journalism because it was obviously done in a few minutes without any reasonable investigation.

Apparently, you were viewing the system in Florida immediately after installation. The rental agents in Tulsa where the system has been operational for almost three months are servicing customers three times faster today than in June.

The rental agent can determine if there is a system malfunction in the same way that you can detect that a typewriter or an automobile is not operating properly.

If there is a system malfunction, then it is a question of the agent's training and experience to select an alternate means of accomplishing the job at hand – in this case, good customer service.

Incidentally, the polling light on the terminal does tell the agent whether or not she is communicating with the Wizard.

John A. DiCostanzo
Greenwich, Conn.

**The point remains that I was delayed and was offered no reasonable explanation for the delay. Since the average customer would not make any further investigation, there was no reason why I should. The sole point of the editorial was that the public should never be left with the impression that computer systems foul things up and make them more difficult than they were when done by hand. Ed.**

*Computerworld* welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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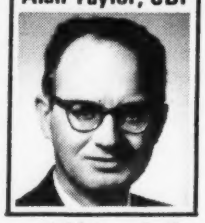
# Our Technicians Are Blind to Organizations' Flaws

**The Taylor Report**
**By**
**Alan Taylor, CDP**



Recently I reviewed two major decisions made within the structure of the American National Standards Institute Data Processing Committee X-3 – the most important standards organization in the DP industry.

The decisions, one of which was instituted by the Conference on Data Systems Languages (Codasyl), were not hasty ones. Each will have permanent importance and was made after a study of at least six years.

Because of the large amount of time devoted to the studies, and the authority of the two organizations, we should certainly expect that the decisions were properly made. But they were not.

Both of the cases illustrate the need for a continuing overview by outsiders of the work of all technicians no matter how important.

It should be noted, however, that the strictly technical work of these committees is not at fault for the improper decisions – it is the structure within which they work – that is the problem.

### Cobol and Privacy

One study involved Cobol, an issue important to computer users and the industry. The other had broader consequences – it concerned data banks, the most feared consequence of computers in the mind of the general public.

In both cases, the initial decisions made by the committees devoted exclusively to the subject have been reviewed and approved by senior reviewing committees, lending further authority to the results and conclusions.

The study concerning data banks – specifically dealing with the issue of individual identification in such systems – has been published and is rapidly becoming a best seller. The Cobol study has not been published yet, but is expected soon.

### Structure Faulty

Both studies are alike in that their basic assumptions are incorrect. The organizational structure within which they were made is faulty.

It seems more than coincidence that both these studies suffer from the same problem. It may be a system of a deeper problem facing us, so let's look at the area in more detail.

In the Cobol study, for instance, the Codasyl group works much like a working committee, doing the technical work and publishing its results. A second set of committees exists to review those results and adopt or reject them – the Ansi X-3 Information Processing Committees.

Codasyl's authority is so highly regarded by the Ansi group that it has delegated all the rights to develop Cobol to it.

This in itself seems faulty. In doing so, Ansi X3J4 has allowed itself to become an inadequate reviewing body, unable to respond adequately to interested parties outside of the Codasyl organization.

### Reasonable on the Surface

On the surface, however, it might appear that such delegation is reasonable. After all, the Codasyl constitution states that "Codasyl is a voluntary informal organization of interested individuals . . . ."

The purpose of the organization, again according to the constitution which establishes the basic framework for the work of the group, is to create a common language and to minimize the differences between different versions of Cobol. It also states that its work will be in the public domain.

These basic postulates outline the whole authority of Codasyl. However, if Codasyl is not working in the manner outlined in the constitution – as could be checked by anyone reviewing its operations – it is not right for Ansi to delegate its authority and trust to the organization.

So let us look into some of the activities of the Codasyl organization.

For instance, shortly after the last Ansi Cobol standard was published in 1968, users in the Cobol community showed a great concern in two areas: the question of bit-manipulation with the language and of collating constant sequence. Both items are simple enough technically, but of great concern to Cobol users interested in standardization.

These questions are also important to the marketing organizations of the various computer manufacturers. Some manufacturers offer normal collating sequence, while others have a less normal or unusual collating sequence built into their systems.

Some have built bit-manipulation facilities into their Cobol compilers, while others have not. It is clear that the firms which have not would be the ones most hurt if this feature were written into the language standard.

Likewise, if the most normal or usual collating sequence were made a part of the standard, the manufacturers offering the less normal mode of operation or the unusual would be affected adversely.

### IBM Delays

Codasyl, even though its constitution states it is made up of *individuals*, has in both of these areas simply abdicated its responsibility to particular *companies*.

IBM, for example, has been holding onto work on the bit-manipulation proposals. It has had the responsibility for designing these since 1969, but has not yet reported its findings or results. As a result, the new standard to be issued in 1973 will not have a discussion of bit-manipulation facilities.

In a similar fashion, Honeywell has had the responsibility for gathering proposals on collating sequences. Again – and it should be little surprise – the work has dragged on for years and no report has been forthcoming. And again, the 1973 standard will stand mute on the subject.

I asked the vice-president and secretary of Codasyl's Programming Languages Committee how he reconciled the statements that the conference was made up of individuals (as found in the constitution of the organization), and the fact that work was assigned to companies and a statement of his that the organization was made up of companies.

His reply was simply: "Well, that is the way it was done before." The chairman of the committee replied: "It was set up this way before. I think it was to avoid antitrust problems."

This is the greatest weakness in the "voluntary" nature of Cobol standardization efforts. Items referred by Codasyl to specific members are allowed to be placed in limbo. As a result, it becomes possible to delay such matters almost indefinitely without the reason for the delay coming to the attention of the user at large.

In fact, records show this technique permits members of the Codasyl group to keep the standard from being updated in the five-year standard revisions just by inaction. But it is not individuals delaying the work, it is firms.

### Ansi Trust Misplaced

All of this makes it abundantly clear that the trust placed in Codasyl by the Bema-sponsored Ansi X-3 Committee is a misplaced trust. The membership and behavior of the Codasyl group are not as advertised in the organization's charter – a key deception.

Yet no one, including Ansi, ACM, DPMA, the U.S. National Bureau of Standards and the members of the committees themselves, has seen fit to check on this fact.

The experts have ignored this basic weakness, the unsolid foundation upon which we base many standards actions.

### Identifiers Clearer

In the second case, it is even easier to find incorrect statements in the Ansi draft on individual identification. This now best-selling document states, "In the area of individual identification, for purposes of standardized information interchange, name alone is not sufficient, nor is identification alone. Name, associated with an identification code which uniquely identifies or distinguishes the named individual is required."

The logic here is false. To start with, a unique identification code alone is sufficient to identify an individual. Properly safeguarded by check digits, a unique number is adequate to identify an individual.

But even ignoring this basic weakness if we can, there is no reason why the name – which might include the stage name, the maiden name, nicknames, religious names and so forth – should be included in such codes at all! It certainly is not required, as claimed, and might actually be harmful.

But nevertheless, the authorities on the committee labored for six years to produce a scheme for standardizing names!

But they have ignored the fact that names do not have to be standardized, because unique identification numbers or other codes would serve the purpose as well.

Why did this happen – how did the Ansi group begin work on name standardization when there was no need for standardizing names? The chairman of the committee on names told me that the group never looked at the concept that both a name and an identifying number would be needed for identification purposes. So it began work immediately to standardize names. "When we met we knew what was wanted, and so carried on with it," she told me.

Harry B. White Jr. of the National Bureau of Standards agreed, saying the committee with the responsibility for standardizing names had simply worked under instructions – never once checking whether assumptions underlying those instructions were correct.

### No Revision Considered

In neither of the two cases cited above did it strike the technical leaders of the study groups that the basic system under which they were operating was faulty – making their work essentially valueless; ie., developing unneeded standards for names or allowing important Cobol work to be relegated to firms with a commercial interest in making sure they were delayed.

Quite the contrary. They felt that the rules should be changed to reflect the present operations! No thought was given to making the operations fit the rules.

This is probably the biggest problem. The technicians, no matter how well qualified in their areas of expertise or whom they claim to represent, show a continuing blindness to the basic flaws of their organizations. The basics of these organizations must be carefully studied – by others than the technicians doing the work.

They, on the record, should no longer be trusted with such professional work.

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# Consider User When Checking, Testing

***Taylor Thoughts***

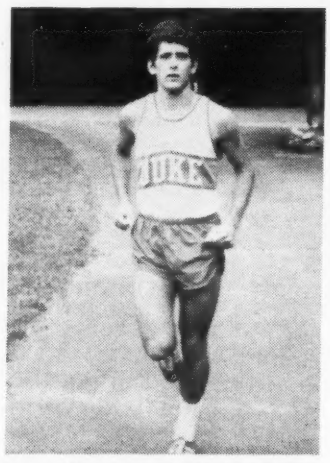
Sometimes non-DP people can view computer operations more logically than the professionals in the business.

One case in point concerns Duke University student Tom Hirsch who recently took a summer job helping the Department of Health Education and Welfare correct (proofread) computer printouts of various contracts.

Previously the health elements – one sentence abstracts from HEW documents and grants – were keypunched, placed onto tape, sorted by term and printed out. The result was a series of lists of institutions, diseases, places where the activities were performed and recipient groups.

Thus, a grant that read "Duke University sponsored the anti-malarial units for impoverished Indians at the XYZ Clinic," would be broken down into lists for its constituent parts, ie., Duke University, anti-malarial, impoverished indians and XYZ Clinic.

The checking operation was performed by eyeballing these lists. Some of the input was not on the list at all. Conjunctions, for instance, were simply dropped.



**Tom Hirsch needed time to run his daily 20 miles so he found a new way of checking computer input.**

After all, when the input was stored and then searched by a retrieval program, the retrieval program only concerned itself with the major elements. It ignored the conjunctions.

Perhaps because Hirsch was not a computer science major, he was not convinced this was the best way to operate. After all, how could the proofreader be sure that the different elements would be put in the proper order when retrieved.

He asked for, and obtained, special printouts which formatted the input exactly the way the users of the system would later see it, instead of the way the retrieval algorithm used the input.

While the retrieval program would only search by major elements (name of the institution, type of work, recipient groups, etc.), it would print out the results in an English sentence, much like the original input.

He found he could still correct the spelling mistakes, the wrong format items, just as well as he could before when they were on their individual lists. But now, in addition, he could also check on the meaningfulness of the output and make sure that the output put all of the elements in their proper places.

He even found he could do the checking faster than before, so HEW got a bargain from the new approach.

That is a worthwhile lesson on how testing and checking can be handled.

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## The Professional's Viewpoint

# PLC Gets No Support on Secret Proposals

By Oscar Watts
Special to Computerworld

The results of the questionnaire on the Aug. 30 Professional Page gave the Programming Languages Committee (PLC) of the Conference on Data Systems Languages (Codasyl) no support on keeping language change proposals secret.

Most respondents also rejected the reasons forwarded by the U.S. Air Force for wanting the Cobol report writer dumped – an action that has since been dropped.

There was even disagreement with current policy from among the standards establishment. R. Risley, CDP, a member of Ansi X3J41, disagreed with the current secrecy policy, and asked for maintenance of the Ansi standard, rather than the unapproved PLC-changed language, which is the current rule.

**This Professional Viewpoint Page was prepared by the Society of Certified Data Processors Cobol Coordinating Committee, in conjunction with the editors of Computerworld. Any society interested in preparing material for this page should contact the editor of Computerworld.**

Charles E. Ficklin of Washington, D.C., commented: "It takes intelligence to use the Report Writer. Why degrade the industry for idiots?"

The most interesting comment, however, came directly from a Codasyl member. He had seen both the correspondence between the SCDP Cobol Coordinating Committee and the PLC – and brought out a complete new plan for operating Codasyl.

The member, who wishes to remain anonymous, breaks his suggestions into four areas – the putting forward of proposals, the committee actions on proposals, committee reasons and committee membership.

When a proposal is presented, he suggests a synopsis of it, including the details as to its implications, to be made available to the whole Cobol community. Access must also be given to the committee to question both the organization putting forward the proposal and the actual author.

"Many times the real author is not the representative on Codasyl, and no one can get access to what he is really talking about, or really meaning in his proposal" he noted.

"This means that when we have a discussion on the proposal only its proposer knows the real reason, or the implications. This does not lead to good decision making.

"We ourselves on the committee and the members of the Cobol community need more preparation before a proposal can be considered. The PLC should adopt a resolution saying that no proposal can be considered until this publicity has been given."

Before the proposal is considered he also feels it should be possible for an organized for-or-against set of arguments to be publicized.

Here he said he has not given thought to the particular format, but at the moment most arguments, if publicized at all, are publicized only from one viewpoint. This, he said, simply does not reflect the true state of affairs. It again fails to lead to an informed community opinion.

The failure, however, of one side to present its case publicly should not permit it to stop a one-sided campaign, he said.

Turning to the problems of a rejected proposal, the Codasyl member challenged Chairman Ronald J. Ham's remark in a July 24 letter that it is impossible for the PLC to give reasons for a rejection except in the most general way. This is only half true, the member argued.

"Reasons can, and indeed must, be given so they can be scrutinized. It may not be necessary to give them on behalf of the whole of the PLC, but certainly each voting member can give his own specific reasons why he votes a proposal down. That way someone can discover both what happened to the proposal, and also judge how many of the reasons are valid. Often we do not have many reasons that are valid," he added.

For instance, he mentioned the discussion on Hamilton Armstrong's proposal for the use of Cobol subscripts with formulas. Cobol subscripts have been argued many times. The particular argument raised against it this time was that it would be possible for a size error to occur without programmer knowledge.

This is true – but Cobol already has this possibility in the COMPUTE verb. Programmers can easily write items that will not create a size error, and should be able to do so for subscript computations, he believes.

The reason why this proposal was rejected then seems to be an excuse. Under Ham's guideline, as stated in his letter, the proposer would never find the reason for rejection any more than Armstrong has been able to do so.

The Codasyl member also believes that faster consideration should be given to proposals.

Turning to the problems of the membership of the committee itself suggested two changes. At the moment, he said, there are the problems involved in whether the membership is properly qualified.

Many of the representatives are unknown to the rest of the committee, or to the general Cobol community, before they are appointed by their organization. This situation perhaps should be avoided, or at least the qualifications of the representatives should be known and published. Then the community will be able to see how much value to put in their technical opinions.

Again, when a vacancy occurs among the committee officers, it should be filled, the member noted. At the moment, the PLC vice-chairmanship – one of the two PLC Codasyl officer positions – is being held on a temporary basis.

The last full vice-chairman, M.L. O'Connell, lost his eligibility for membership when he moved from Sanders Associates early this year. He has since been renominated by North American Rockwell, but cannot yet get back membership because of the complicated requirements of the bylaws.

These appointments seem to be currently an item under the control of the chairman alone, and a more democratic method is needed.

Currently, membership is barred to user groups on the specious argument that user groups are mere captives of the manufacturers – but some user groups certainly are not just captives. The member feels they should be admitted.

*Oscar Watts, CDP, CPA, is executive vice-president of Automated Information Inc., St. Louis. He serves as chairman of the SCDP Cobol Coordination Committee.*

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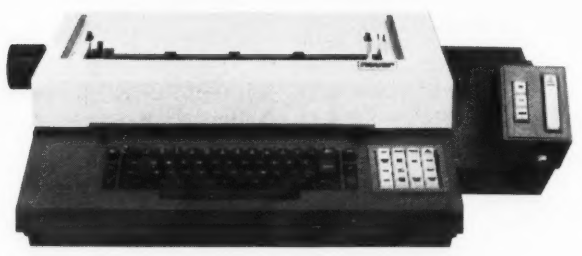

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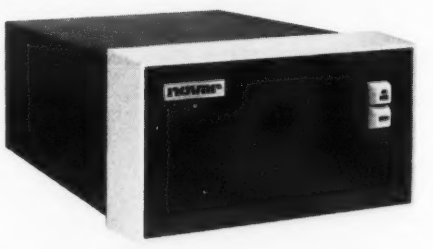

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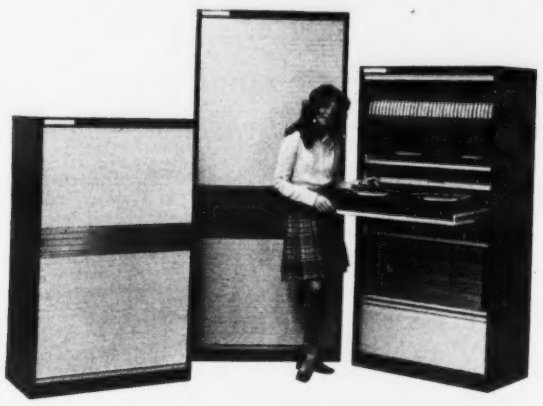

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# Random Notes

## Package Speeds Nova-Based Data Conversion, Arithmetic

CHERRY HILL, N.J. – Users of Data General Novas and Supernovas can now handle data conversions and multiplication and division operations 60% faster than before, with a package of eight software routines from Computer Dynamics Corp.

The entire $750 package fits into 118 words of storage, including room for common and external constants required by the routines. There are separate entry points for each of the eight operations supported by the package.

The package can be obtained from the company at 401 Cooper Landing Road, 08034.

### Capex Adds Cotune Analyzer To Cobol Optimization Line

PHOENIX – The Cotune execution-time analyzer package for Cobol programs, developed by United Data Services Inc., is now available from Capex Corp., as part of its Cobol optimization line.

Cotune gathers information during execution of a Cobol program, then prints a histogram alongside the source statements to show the percentage of CPU time spent with each statement, and the number of times each statement was executed during the run being analyzed. Cotune operates under OS/360.

Capex is at 2613 N. Third Ave., 85004.

### 'Super/Pay' Available Monthly

LOS ANGELES – The Super/Pay payroll and personnel system is now available on either a purchase or a monthly lease plan, according to the vendor, California Datalease Systems and Financial Corp.

Written in Cobol to operate under either DOS or OS/360 systems with a minimum of 48K bytes of core, the package supports the processing of multiple divisions or companies, through the use of "profile" records that define each company's needs. The lease plan costs $62/mo.

The package sells for $960 from 6430 Sunset Blvd., 90028.

### NCR Aids Fashion Buyers

DAYTON, Ohio – Fashion buyers can identify style trends more quickly with a free Fashion Reporting System software package from National Cash Register Co. The package generates reports on demand, rather than on a fixed-processing cycle which may be too slow to allow reaction in the fast-moving clothes marketing business.

Reports which can be produced include style history; exception activity; style status; class price line; and class characteristics. Written in Cobol, the package requires a 32K Century 200 with three tape drives and a dual-spindle disk unit.

## Free Newsletter Explains

# Codasyl Says 'Closed Groups' Aren't

By Don Leavitt
of the CW Staff

MONROEVILLE, Pa. – Like a convert to a new religion, the Conference on Data Systems Languages (Codasyl) is suddenly making a strong effort to mend its ways.

According to Vol. 1, No. 1 of a sparkling new, free newsletter, Codasyl really wants users to know what it is and what it does. It also hopes the quarterly publication, edited by Gerald E. McKinzie of U.S. Steel, will stimulate user comments about what has been done or needs to be done to make Cobol a better language.

Noting that Codasyl committees have been called "closed groups that deliberate in clandestine meetings held in exotic surroundings," McKinzie uses part of the first issue to define what each committee does, who the chairmen are and what their company affiliations are.

Going further, he lists all the member organizations of the Programming Languages Committee (PLC) and cites the current representatives, including Marjorie F. Hill of Control Data, author of the *World of EDP Standards* [CW, Sept. 13].

Noting that a new Cobol standard is beginning to take shape under the auspices of the American National Standards Institute, the newsletter traces year-by-year the development work that has been done and accepted by the PLC as part of the Cobol language, since the last standard in 1968.

Most of the changes are just named in the newsletter, McKinzie admitted, but detailed explanations of the enhancements through 1970 are available in the $2.50 Journal of (Cobol) Development published for Codasyl by the Canadian Government Specification Board in Ottawa.

Because a modification of the COPY facility, adopted by the PLC in June of this year, is almost certain to be part of the new standard, McKinzie devotes more space to this change than to other recent ones.

#### Two Proposals

In addition to background, the newsletter spells out salient points of two proposals now in the development stage under the PLC.

The reasoning behind the need for a user-defined collating sequence to be used in compares (with the IF and SORT verbs, for example) – and how the committee is meeting the need – is one project cited by McKinzie.

Asynchronous processing, also known as random processing or tasking, is another subject of current interest, the editor noted. A proposal presented by the Asynchronous Processing Task Group was tabled until the October PLC meeting, pending a rewrite of several amendments.

The newsletter ends with a listing of the PLC meeting dates, places (not all exotic) and host organization.

Users are asked to send requests for the newsletter, comments or complaints to Box 124, 15146.

# 'DYL-260' Links File Handling, Report Writer/Composer Support

VAN NUYS, Calif. – Data manipulation capabilities, applied to files on most media in any of the common file structures, can be coupled to some novel report writer/composer features, with the DYL-260 software package from Dylakor Computer Systems, Inc.

The file-handling features include control of both input and output files, record and field selection from within the input files and both logical and arithmetic operations on the data.

The computational functions (limited to add, subtract, multiply and divide) are expressed in symbolic form, and the formulas are processed in straight-forward left-to-right steps. Parenthetical expressions, with hierarchies of priority, are not part of the DYL-260 capabilities, but insertion of literals in the formulas is, the company said.

The system, which rents for $80.60/mo, can be used solely for file maintenance but that would deprive the user of several features built into this load-and-go report writer package. The coding looks, at first, very much like conventional RPG but the similarity is deceptive.

DYL-260 supports many RPG-like features: pagination, insertion of headings when specified and "rolling" and printing of subtotals and totals when control breaks are sensed in designated fields.

#### Programming Eased

The Dylakor system relieves the programmer of laying out column headings across a specification sheet, of positioning fields under the headings and of creating seemingly endless series of output-editing masks.

All of these composing tasks are included in the program logic. The headings and column entries are spaced across a page evenly without programmer intervention. Full text for multiline headings are written and marked for stacking on a single coding line.

Output editing is performed under control of user-inserted single character codes: "Z" for zero-suppress, "E" for complete editing including separation by thousands and insertion of decimal points at appropriate points and "D" for date edit in an MM/DD/YY format.

The system can support up to seven levels of totals and the data to be printed at detail or total time is indicated by an X in the appropriate column of the Report Print Line specifications.

The DYL-260 OS/version requires approximately 20K bytes of core. The DOS implementation, expected later this fall, will have about the same requirement.

Dylakor is at 16625 Saticoy St., 91406.

# 'QCOS' Eases Inspectors' Work

PRINCETON, N.J. – Manufacturing inspectors can be made more sensitive to developing situations without going into real-time process control, by using the Quality Control Operating System (QCOS) software for the Decsystem 10, from John A. Keane and Associates.

QCOS is a modular application package that operates under a DEC-supplied operating system. It is a time-sharing system that provides responsiveness far closer to real-time than would batch-oriented software, Keane said.

The package generates a set of user-defined status reports immediately after inspection data has been submitted from a teletypewriter at the inspection station. The package also includes modules that support interactive inquiries made against the product history files, Keane noted.

The test data is compared with acceptance criteria (defined at system generation time by the user), and an acceptance status report is sent back to the user terminal. The new data is also compared with previous history to determine whether there are any significant deviations from established operating norms.

Normally the inspection is sent in and the reports sent out once each shift, the company said, but it added there is nothing in the QCOS logic to prevent the user from exercising the program more or less often.

The interactive inquiry capabilities allow the user to perform multilevel tracing of rejection problems, each level providing a closer identification of the problems.

Written in Fortran, QCOS uses 20K words of memory on the Decsystem 10. Lease costs are between $200/mo and $410/mo, depending on the modules selected.

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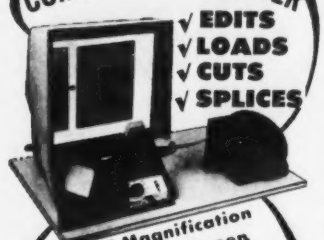

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# Massive Projects Planned, Controlled With Cybernet Critical Path Analysis

MINNEAPOLIS – Any project of sufficient size or complexity to cause scheduling problems can be kept in check with the Project Management and Control System (PMCS) software now available on the Control Data Cybernet remote-computing service.

Though it follows critical path method techniques, the remote batch-oriented PMCS goes further than comparable systems. It can be used to generate Pert and other reports, and to perform financial analysis of the project under study. These reports can be based either on calendar day or project day number, Cybernet said.

Developed by Multiple Access Ltd., Toronto, PMCS allows the user to define his project in terms of events to be accomplished and activities required to achieve events. He also sets time estimates for each activity and describes possible restraints pertinent to start and completion dates of project elements.

PMCS schedules projects with as many as 15,000 activities and 12,000 events. These elements are combined into meaningful groups or subnetworks, and an unlimited number of these subnetworks can be specified for analysis.

The analysis may take place before time calculations, for processing efficiency, or after processing, for efficient reporting, the network said.

**Update Runs**

While events and activities along the critical path determined by PMCS must be completed as scheduled to meet project objectives, update runs can be made during the project's course to show budget and schedule deviations. These would allow management to see how these changes will affect the remainder of the project, and to take appropriate action.

The cost processor portion of PMCS maintains budget commitment and actual costs, and generates several report formats.

PMCS is available through the facilities both of Multiple Access, in Canada and New York State, and the 40 local offices, nationwide, of Cybernet.

Cybernet headquarters is at 8100 34th Ave., 55440.

Usually a third party makes a crowd.

Our third party can make a company.

Starting a company that makes computer equipment can be easy.

Servicing what you sell can be a problem.

And that's where we come in—with a nationwide service system. The same system that provides service to all customers of GTE Information Systems, a major supplier of total data communications systems.

Chances are that one of our more than 500 service specialists in 75 cities is within a 60-minute drive of 90% of your customers.

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He's not a repairman (sometimes called a customer engineer); he's a man that knows computers and computer equipment.

To us he is a specialist. To you he could be a godsend.

Our specialist saves you the cost of supporting a large field staff. And your customers get the benefit of fast service.

If three's company, that's nice company to be in.

For details call Chuck Olano at 303-449-7800. Or write to him at GTE Information Systems Service Company, 2560 Arapahoe Boulevard, Boulder, Colorado 80302.

GTE INFORMATION SYSTEMS

## Packages Compare In-House Standards, Worker Performance

GARDEN CITY, N.Y. – Managers with access to a 64K IBM 360 can measure the performance of their workers against current in-house standards in a low-profile way, with the Work Management packages from the Unisys Computer Group.

Work Management I and II can be used with virtually any type of activity, without the imposition of arbitrary industry-wide standards, or the inconvenience and distraction of time-study observers in the work areas.

The packages utilize the worker's own time sheets, with activities coded in as gross or detailed terms as management wishes.

The first program analyzes this input by activity code. It calculates three possible "standard" bases (mean, median and mode), according to conventional mathematical formulas, so the supervisor is free to choose the most appropriate method for the real situation.

Output from this package is a chart showing all employees involved in the particular activity – the supervisor or supervisors can see how well each worker performs compared to the others.

**Total Performance**

Work Management II, on the other hand, is oriented toward the workers' total performance across all activities. With this overview, supervisors can shift employees to those tasks they perform best, or away from those they do poorly.

Each of the packages requires a 64K configuration and each costs $6,500. They are written in ANS Cobol.

The capabilities of the packages are also available on a service basis, the company noted from 1461 Franklin Ave., 11530.

## Service for Jewelry Firms Includes Current Gold Cost

WARWICK, R.I. – The current prices of gold and silver are included in the preparation of customer invoices under an on-line service for jewelry companies in Rhode Island and Southern Massachusetts, recently announced by Information Sciences Inc.

The new system provides a complete range of services connected with order processing. It will accept and price customer orders, produce invoices and monthly statements and accumulate up-to-date inventory and sales records for management review.

The order processing is said to take into account any combination of metals, finishes and special packaging arrangements.

ISI is at 14 Jefferson Blvd.

# COMMUNICATIONS

## Data Briefs

### FCC OKs First Bell Route To Use Data Under Voice

WASHINGTON, D.C. – The Federal Communications Commission has approved the first AT&T route to use Data Under Voice (DUV) techniques.

The authorization will allow AT&T to convert existing radio channels for the addition of digital channel groups between New York and Chicago. AT&T said the new facilities will replace existing wideband data channels.

The DUV method allows a digital data stream to be introduced on the lower end of existing microwave channels. The technique is expected to provide the long distance "backbone" for AT&T's Digital Data System, scheduled to begin operations in early 1974 [CW, Aug. 30].

It will take about a year to complete the DUV facilities between New York and Chicago, an AT&T spokesman said.

### TTYs Get Preset Dialer

COLUMBUS, Ohio – The Design Elements Division of MI$^2$ Data Systems, Inc. has announced the automatic preset dialer for use with its 103GM, 300 bit/sec data sets for teletypewriter installations.

The dialer is a method of minimizing the time and effort involved with the repetitive dialing of a terminal or computer telephone number. Two versions available allow the telephone number to be either preset by the operator with thumb-wheel switches on the panel, or the number can be hardwired

The dialer consists of a panel that mounts in a Model 33 or 35 Teletype and contains operator controls and the electronics package.

The dialer costs $180 from MI$^2$ at 1356 Norton Ave., 43212.

### DUA to Meet on Regulation

SOUTHBORO, Mass. – The Digitronics Users Association will study the effects of communications services and regulatory agencies on the user at its seventh annual meeting Oct 16 and 17 in New Orleans.

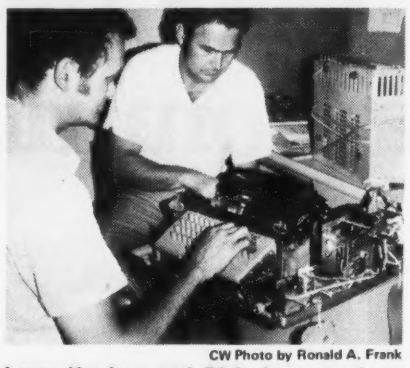
In a session on "Does Regulation Protect the User?", Bernard Strassburg, chief of the FCC's Common Carrier Bureau, will participate with a representative from the National Association of Regulatory Utilities Commissioners, and others. Bell System computer/communications services will be discussed in a speech by AT&T's Theodore L. Simis, vice-president for data services.

The trade-off between centralized communications mainframes versus decentralized minicomputers will be discussed in another session by Roy Salzman of Arthur D. Little and representatives from minicomputer vendors.

Information about the conference is available from Mort Siegelbaum, executive secretary, Box 33, 01772.

## Does Own Maintenance, Too

# Kiewit Center Buys Its TTYs and Saves



CW Photo by Ronald A. Frank

**Larry Kershaw and Rick Joyce work on teletypewriter at Dartmouth maintenance center.**

By Ronald A. Frank
of the CW Staff

HANOVER, N.H. – With the increased availability of non-carrier teletypewriters users can enjoy significant savings by purchasing their TTYs and doing their maintenance in-house.

The Kiewit Computation Center at Dartmouth College began to replace its rental TTYs about two years ago. It purchased Model 33 ASR originate-only units and established an in-house capability with three technicians to perform repairs and provide preventive maintenance.

Before the switchover to in-house TTYs, Dartmouth leased its equipment from Western Union Data Services Co. For Model 33s with built-in modem and the required Bell DAA, Kiewit was paying about $65/mo including maintenance.

**Costs $48/mo**

With the purchased units the cost has dropped to $48/mo, according to Tom Byrne, assistant director of the Kiewit Center. The figure includes a planned three-year write-off for the purchased teletypewriters, and next year after the units have been fully amortized, the monthly cost will drop even lower, Byrne said.

A written-off Model 33 will cost the school about $25/mo to maintain including the cost of spare parts, salaries for the maintenance technicians and the cost of a van used to service sites within a 100-mile radius of Dartmouth.

About 137 TTYs are now covered under the in-house program, and last year the Kiewit Center saved about $58,000 compared with the cost of outside equipment.

There are other advantages. Even though the terminals have been written off, their utility to the school remains. Some faster non-impact teleprinters, such as the Texas Instruments Silent 700, are now being evaluated on a trial basis.

If Kiewit decides to upgrade the terminals now installed, the older TTYs will probably be used at other on-campus sites.

No decision has yet been made on replacing the TTYs, but based on the operating experience with the purchased units, Kiewit will probably purchase its new machines, and train its maintenance staff to keep them running.

# Plugboard Lets Univac Processor Emulate 2780 With IBM 360 /370s

SAN RAFAEL, Calif. – The Godfrey Systems Inc. plugboard allows a Univac 1004 or 1005 processor to emulate the operation of an IBM 2780 terminal when used with 360 and 370 systems.

The GS 2780 plugboard contains a hard-wired program together with an Intel integrated circuit mini that handles code conversion and line discipline. The complete plugboard can be mounted into the 1004 by the user and only a 110 V outlet for the GS 2780 is required.

The 1004 was introduced in 1963 and is programmed by a manual plugboard. With the addition of the GS 2780 electronic board, the CPU becomes an attractive remote terminal for use with IBM systems, according to Godfrey systems.

Current prices for the 1004 card-oriented processors are about $6,000, according to a Godfrey spokesman. Based on this price together with $6,000 for the GS 2780, the user can configure a 2780-type terminal at considerable savings compared with an IBM 2780 terminal purchase price of about $43,000, he said. Comparable independent terminals cost about $17,000, he added.

The enhanced 1004 operating with the GS 2780 can interface with standard modems operating up to 4,800 bit/sec. Card read/punch and printer speeds are dependent on line speeds. The GS 2780 operates with models A, B and C of the 1004 and all models of the 1005, the company said. First deliveries of the plugboard are set for January 1973.

## Cassette Recorder Suited For T/S, Source Data Entry

SUNNYVALE, Calif. – Anderson Jacobson, Inc. is now offering a cassette recorder to complement the operation of its AJ 841 Selectronic keyboard printer terminal. The AJ 841, an on-line conversational terminal, is a replacement for the IBM 2741.

The AJ 4120 cassette unit stores up to 70K characters on computer-grade tape in a Phillips cassette. In addition to duplicating paper-tape functions, the AJ 4120 cassette recorder can search up to 99 files automatically and editing line by line.

The primary applications of the terminal/cassette system are in time-sharing and source data entry to reduce transmission time and cost. The combination terminal and cassette recorder can be leased for $200/mo. The company is at 1065 Morse Ave., 94086.

# Comsat, MCI Lockheed Propose Joint Domestic Satellite System

WASHINGTON, D.C. – Communications Satellite Corp. (Comsat) and MCI Lockheed Corp. have proposed the operation of a jointly owned domestic satellite system to the Federal Communications Commission.

If the plan is approved, it is expected that Comsat would provide technical expertise to launch the satellite and MCI Lockheed would "retail" the available facilities to data and other users.

But the data users should not order their channels yet since the earliest a domestic system could be operational is about two-and-a-half years from now, according to an MCI-Lockheed spokesman.

**Two Services**

The system would offer two types of service based on the size and needs of the data users, according to the spokesman.

The first would offer bulk channels for the large user.

"I guess there would be several large companies with high enough communications requirements to operate their own ground stations," the spokesman said. They would be the ones to use this service.

**Turnkey System**

The other offering envisioned would be a total turnkey service, which would allow a user to transmit data to a carrier's regional ground station and have the system carry the data from there.

The turnkey links would include software designed to overcome the delay problem inherent in satellite transmission, the MCI source said. The delay is caused by the distance the message has to travel to and from the satellite system.

The proposed system would use a 3-axis stabilized satellite which would "hover" over one point in the U.S. after launch.

We show a history of making the printers that make money for EDP centers through off-line printing. You should see our System/4000 Satellite Printer do it. It interprets mainframe print format instructions, and processes 7- and 9-track tapes of from 200 to 1600 bpi densities at up to 1340 lpm. Get the System/4000 with a FACT controller to handle multiple-format programs and data tables. Get it with an ACT controller to translate vertical-format and data-character sets from magnetic tape codes to printer action codes. Getting the just-right Satellite can be a profitable experience. Especially since we can beat *any* competitor's price. So get in touch.

**Our off-line printers: you can profit from our experience.**

DATA PRODUCTS

**Systems Marketing Offices:** Boston 617/237-1950; Chicago 312/325-6630; Cleveland 216/464-2151; Dallas 214/231-8265; Detroit 313/354-5880; Los Angeles 213/475-0681; New York 212/532-9504; Philadelphia 609/667-2000; San Francisco 415/421-9375; Washington, D.C. 301/652-8120. **Home Office:** Data Products Corporation, 6219 De Soto Avenue, Woodland Hills, California 91364, 213/887-8000, TELEX 65-1347.

# Before You Buy Any More Read Our Data Communications

The picture shows part of Data General's data communications product line.

The whole line is described succinctly in our data communications price list.

It gives you basic specs, prices, hardware prerequisites, and service contract prices.

If you buy communications hardware, you should read it.

It starts with the Nova minicomputers—versatile tools you plug into a system anywhere you need to do a complex communications job reliably and economically.

Then there are asynchronous and synchronous multiplexors, high speed and low speed multiplexors, and single-line controllers.

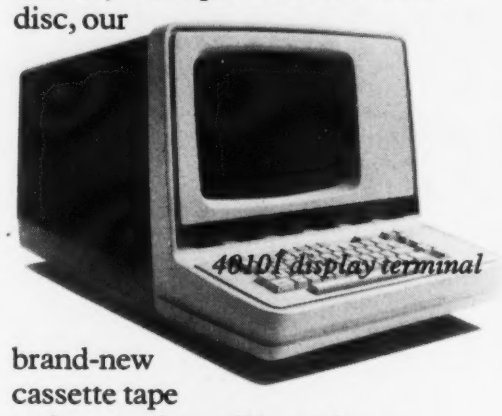
There's a multiprocessor interface that ties a string of Novas into a powerful processing network.

There's a 360/370 interface that helps your big computer crunch numbers as fast as it ought to.

These interfaces plug right into any Nova computer chassis. Clean, simple, and reliable.

We've also built in redundancy, so your system keeps going even if some of your hardware is down.

We've got whole pages of communications-oriented peripherals: hardcopy and CRT terminals, the super-reliable Novadisc, our




brand-new cassette tape units, a variety of line printers.

But there's no software on the price list: it's available free with the hardware. Each communications interface has its own software package, and with any computer with over 12K of memory you can get Realtime Disc Operating System (RDOS) or Realtime Operating System (RTOS). They have all the tools you need to write your application programs.

Our communications products are backed by the same technological leadership, product reliability, and sales, service, and applications support that have made Data General the world's number two minicomputer company, with over 3,500 installations worldwide.

Sure, we're cocky about our data communications products.

If you're buying data communications equipment, there's no way we can't help you.

# Communications Hardware, Just Price List.

*4025 360/370 interface*

*8101 Nova 1200 central processor*

*price list*

*tape reel*

☐ Send price list.
☐ Send Data Communications catalog (in-depth application/product information).

Name_____

Company_____

Address_____

City_____ State_____

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| Washington . February 20-22 | San Francisco .....April 3-5 |
| New York ..Feb. 27-March 1 | Kansas City .....April 11-13 |
| Atlanta .....March 13-15 | Chicago .....April 17-19 |
| Houston .....March 20-22 | Cleveland .....April 24-26 |

If you'd like to consider an exhibit space, we've got a lot of other details for you – including audit figures on 1972 attendance, candid quotes from attendees and exhibitors – and some very interesting sales figures. Just call Dottie Travis at (617) 332-5606. Or ask your *Computerworld* representative for a free brochure.

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### Power Breeder Reactor Project

# Modems Speed Nuclear Energy Research

OAK RIDGE, Tenn. – Scientists at the National Laboratory of the Atomic Energy Commission are using high-speed data modems to aid in solving basic problems in the field of nuclear energy. The laboratory is operated by Union Carbide Corp. Nuclear Division for the AEC.

Basic research data compiled by Union Carbide in Oak Ridge will be used in development of a nuclear power breeder reactor which could provide a method of generating clean, economical electric power.

**3 Sections Linked**

The data accumulation network incorporates GE Diginet 330 high-speed, limited distance modems. It funnels information from two sections of the laboratory to a third location, via five dedicated full-duplex communication links.

The 330s operate at 9,600 bit/sec to move data from one building within the laboratory complex to another. Four of the modems are used in conjunction with CRT displays which support overall project data analysis.

One of the displays is in a room with the computer used for immodiate analysis and coordinating while the others are linked over 3,500-ft telephone cable pairs to the CRTs at the Oak Ridge electron linear accelerator located in a separate building.

**Display Programming**

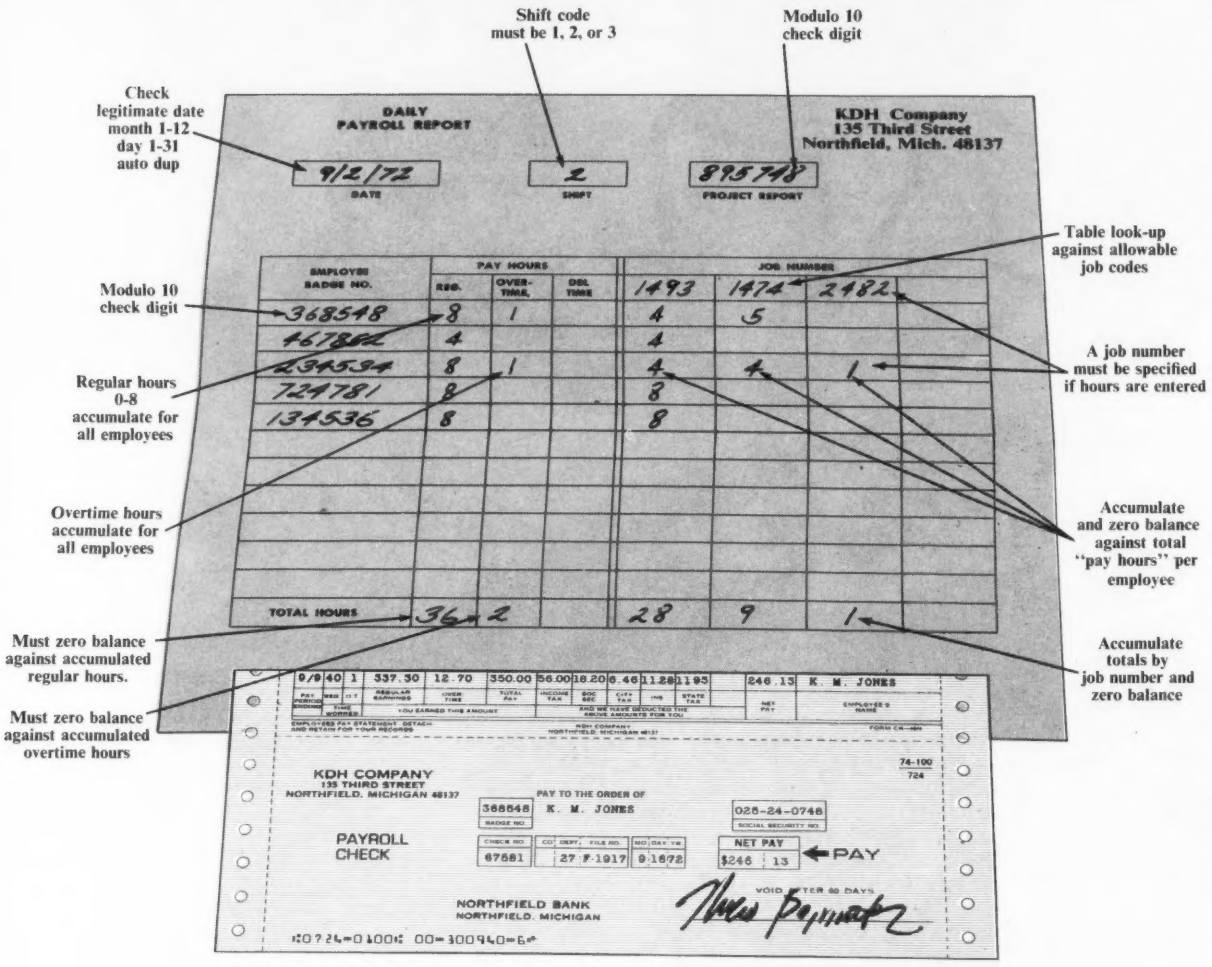
Eight blocks of data with 250 points or channels each are displayed with light-pen-selected commands from a teleprinter request for display programming. An attached set of cross-section data containing a maximum of 365,000 channels is also included.

Requests for a particular service such as selecting a working area, type-out of channel number, energy and counts, start and stop scan, change scan direction, increase and decrease speed of scan and other commands can then be initiated by light pen, by operator switch selection or by typing groups of teleprinter characters.

All these service requests as well as the resulting data blocks are then transmitted via the 330 modems used in a 12-line communications controller attached to a Digital Equipment Corp. PDP-15.

All of the modems are switch-selected to operate at the 9,600 bit/sec speed. Calculations to support the display picture and service requests are done with some calculation requests passed on to the central computer facility.


# REMOTE PAYROLL ENTRY AND CHECK-PRINTING FROM SYCOR.


Shift code must be 1, 2, or 3
Modulo 10 check digit
Check legitimate date month 1-12 day 1-31 auto dup
DAILY PAYROLL REPORT
KDH Company 135 Third Street Northfield, Mich. 48137
9/2/72
DATE
2
SHIFT
895748
PROJECT REPORT
Table look-up against allowable job codes
Modulo 10 check digit
Regular hours 0-8 accumulate for all employees
A job number must be specified if hours are entered
Overtime hours accumulate for all employees
Accumulate and zero balance against total "pay hours" per employee
Must zero balance against accumulated regular hours.
Must zero balance against accumulated overtime hours
Accumulate totals by job number and zero balance
EMPLOYEE BADGE NO.
PAY HOURS
JOB NUMBER
TOTAL HOURS
KDH COMPANY
135 THIRD STREET
NORTHFIELD, MICHIGAN 48137
PAY TO THE ORDER OF
K. M. JONES
PAYROLL CHECK
NET PAY
$246 13
PAY
NORTHFIELD BANK
NORTHFIELD, MICHIGAN

If you're responsible for getting payroll checks to remote locations, you know how important it is that they be delivered on time. Sycor's Model 340 Intelligent Communications Terminal now frees you from the nagging concern that a payroll might be delivered late.

Payroll report data *can be captured at remote locations* on the Sycor 340, where it is automatically checked and edited for accuracy. At the push of a button, the 340 transmits the data at high speeds over the public switched telephone network to a CPU using sophisticated binary synchronous procedures to assure that no data is lost and no erroneous data is received. The processed data then can be sent back, unattended, for printing of payroll checks *at the site* via any of three types of dependable Sycor printers (30 cps, 165 cps and 200 lpm).

As a result, your payroll is prepared quickly, economically and accurately; your employees are paid on time; and you stop worrying.

The Sycor 340 can do this job, and most any other you might have, because Sycor provides users with T.A.L. (Terminal Application Language). With T.A.L. you can write sophisticated programs tailored to your own terminal applications for execution in an optional one microsecond terminal memory.

Want to know more? Call us at (313) 971-0900, or drop us a line. We'll be glad to tell you more about how the Sycor 340 can help to meet your payroll.

SYCOR INC
100 Phoenix Drive
Ann Arbor, Michigan 48104
(313) 971-0900

## The Sycor 340 Intelligent Communications Terminal.


## Honeywell Modem Said to Operate At 19.2 kbit/sec

TAMPA, Fla. – A high-speed modem that can operate at speeds up to 19.2 kbit/sec over conditioned voice-grade telephone channels has been introduced by Honeywell.

Called the Vodat, the modem is switch-selectable to operate at 4.8, 9.6, 14.4 and 19.2 kbit/sec in both transmit and receive modes. The modem is said to incorporate technology that enables it to outperform other devices at 4.8 and 9.6 kbit/sec, and allow for the first time operation at 14.4 and 19.2 kbit/sec, according to Honeywell.

At the two slower rates the modem is said to be well suited to applications involving high-speed terminals, data concentrators and time-division multiplexers.

At the higher-bit rates the Vodat, operated in conjunction with a delta modulation type analog/digital converter, will satisfy requirements for a relatively inexpensive digitized voice system, the company said.

Options available in the solid-state device include a unit coder whose function is to improve bit-error-rate performance and an option for multiplexing up to four lines of 2,400 bit/sec synchronous data.

## Polling Adapter, Graphics Module Added to CRT Line

SALT LAKE CITY, Utah – Beehive Medical Electronics Inc. has introduced two features to its line of CRT display terminals that can be added to the Model I, II and III already in use.

The graphic expansion module gives users the advantages of simultaneous alphanumeric and graphic displays. The module includes a matrix capability of 256 by 512 points at a cost of $1,500.

An additional two modules can be added at $750 each, the firm said. Included with the graphics module is a pointer which allows a vertical line to be addressed at any one of the 512 horizontal points on the screen. When a required point is located, 10 positions on either side are read, a spokesman said. The pointer costs $300.

The $350 polling adapter enables a CPU to operate with up to 96 Beehive CRTs "from a single line." The addition of a single printed circuit allows the terminal to accept a polling sequence, the company said. The added features are available in 45 days from Beehive at 1473 S. Sixth St. W., 84104.

## Bits & Pieces

### Image Digitizer Can 'See' Discrete Parts, Patterns

MINNEAPOLIS – Dicomed Corp. has a process and inspection transducer which can "see" discrete parts, patterns and textures and convert the sensed images into digital output for sorting, grading, counting, inspecting and other functions normally done by the human eye.

The Model 50B Image Digitizer includes a camera unit connected to a control unit, normally a minicomputer.

Typical applications of the 50B Digitizer include on-line inspection for missing components, misalignment and surface irregularities.

The unit costs $23,000 from Dicomed at 7600 Parklawn Ave., 55435.

### Singer Makes Two Tape Perforators

SAN LEANDRO, Calif. – Singer Graphic Systems has two paper tape perforators designed to punch unjustified TTS-coded tape for input to the 8000 Series Photomix phototypesetters.

The 8251 Electronic Perforator includes as standard equipment a code display showing the bit pattern of the last code punched.

The 8252 Electronic Perforator features a code storage system in which complex formatting code sequences or repetitive text can be stored and punched whenever needed. The memories are loaded from prepunched tapes through an optional programming reader or directly from the keyboard. A 32-character visual display unit is standard on this model.

The 8251 is priced at $2,700, with the optional 32-character display unit an additional $1,000. The 8252 costs $5,850. Delivery is 90 days from 2350 Washington Ave., 94577.

### Data 100 Adds Plotting to 78-3

MINNEAPOLIS – Data 100 Corp. has added plotter capability to the company's Model 78-3 Programmed Terminal system, an IBM 360/20 replacement.

Software and interface are provided for either Calcomp or Houston Instruments plotters, for use on-line or in an off-line magnetic tape-to-plotter operation.

The interface plus software costs $90/mo on a one-year lease, including maintenance. Delivery is 30 days from 7725 Washington Ave. S., 55435.

### Tektronix CRT Unit Brighter

BEAVERTON, Ore. – The "Ultra-Bright" 613 large screen CRT unit from Tektronix is a data storage and display unit which puts out four times the brightness of the older 611 at one third the cost, according to the company.

The 613 costs $2,200, with quantity discounts available. Delivery is three weeks for the horizontal model and four weeks for the vertical, from the firm at P.O. Box 500, 97005.

## Advanced Function Capability

# Itel Boosts 7830/7330 Disk Subsystem

By E. Drake Lundell
of the CW Staff

SAN FRANCISCO – Users with heavy disk write requirements get more throughput with an enhancement to the Itel 7830/7330 disk subsystem than with the IBM 3330 unit.

The Advanced Function Capability (AFC) added to the device can increase overall throughput by up to 10%, the firm said, but the savings can be higher in some applications. The AFC frees a disk controller during the formatting part of a write operation, the firm said.

Itel said the formatted write is used when a sequential file is written, during library updates, loading data bases or compiles.

One large user, however, said most of his operation involved updates in place, which would not require the formatted write and so the new enhancement would not increase his throughput dramatically except in some situations.

Simulations have found, Itel claimed, that while disk-read operations are usually more numerous, disk-write operations require more controller time and tie up the controller longer.

This is because the controller is usually "locked" into the disk drive during the formatted write operation, Itel said.

In a formatted write, data is written onto a track and then the rest of the track is erased to avoid data repetition. With the IBM 3330 system, the controller is tied up while this erase occurs.

With the AFC, the controller is disconnected from the drive while the erase part of the operation occurs.

This is particularly important, Itel said, when a user is utilizing a 16-device address, i.e. when 16 drives are connected to one controller, because a few writes could saturate the entire system.

"Simulation results have shown that dedicated write activity – for example, an Isam load – on only two 3330 spindles can result in complete controller dedication," Itel said.

The same simulations showed that an Itel controller with AFC was tied up less time with 16 7330s than the IBM controller with two 3330s.

Itel said the format write is necessary when a record is written except when a user is updating an existing record.

The savings will be particularly noticeable for larger installations, Itel said, but added there would be some time savings even on the smaller installations.

"AFC on our 7330 disk subsystem enables the user to gain at least 50% more data transfer capability and 25% faster response on a subsystem with OS workfiles and Hasp," the firm added.

# Disk Controller Interfaces 2311, 2314 Drives to Univac 418 II CPUs

IRVINE, Calif. – Telefile Computer Products Inc. has a disk controller that allows IBM 2311 and 2314 drives to connect to Univac 418 II CPUs.

The DC-36 controller interfaces with the 418 parallel input and output channels and controls up to eight IBM drives. Commands are received from the Univac CPU, interpreted by the Telefile controller and translated into a format compatible with the disk system. The DC-36 provides eight 36-bit words of buffering and signal timing for the core-to-disk data transfers, the company said.

**Self-Contained**

The DC-36 is a self-contained system with simultaneous seek operations, ease of programming with only eight commands, verification of track location through hardware, monitoring of the disk drive and disk subsystem status, low CPU core requirements for software and the ability to read or write multiple records with a single CPU command.

The controller features the direct transfer of data to or from memory, eliminating the blocking of I/O channels, the company said.

The controller can perform many hardware functions normally under software control. Included are record address verification, cyclic redundancy checks, formatting of record headers and write protect operations. Record length is selectable under software control and software diagnostic routines are included with the controller.

The DC-36 costs $17,000 or more depending on configuration. Delivery is 60 days from Telefile at 17785 Sky Park Circle, 92664.

### DEC Adds Bus Converter

MAYNARD, Mass. – Digital Equipment Corp. has introduced a bus converter device that extends the benefits of Omnibus peripherals interfacing to PDP-8/Is and 8/Ls.

The DW8E bus converter allows peripherals for the PDP-8/E to be plug-compatible with the earlier PDP-8 models.

Peripherals that can be used with the DW8E include disk and mag tape subsystems and low-speed devices such as card readers and punches, DEC said. Also included are most of the 60 8/E peripherals such as printers, CRTs and communications equipment.

The DW8E is supplied with all cabling and power supplies required for interfacing. The unit costs $1,500.

# 2 Add-On Memory Independents Have Units for 370, PDP-10

Recently introduced add-on memories from two independents include units for IBM 370 users and DEC PDP-10 users.

Fabritek, Inc., Minneapolis, has add-on memories for the 370/155 and 165 that can save users "25% to 40%" and cut space requirements in half, compared with comparable IBM core units.

A typical lease price for a 512K add-on box under a two-year lease will be $4,500/mo plus maintenance for $580/mo. Purchase price for the same unit will be $180,000, the company said.

The Model 70 Plus memories utilize a production method which allows up to 2M bytes in a single cabinet the size of an IBM 3360, the company said.

The Fabritek units are equivalent to the IBM memories with a capacity of 256K and 512K bytes and all models will have an upgrade capability to 2M bytes at the user's site, the company said. First deliveries of the 370 add-on memories are scheduled for the fourth quarter of this year. Fabritek is at 5901 S. County Road 18, 55436.

Systems Concepts Inc., San Francisco, has a plug-compatible add-on memory for the DEC PDP-10 that is "internally interleaved" so typical memory cycles take "less than 500 nsec."

The add-on memories come in 50K, 64K and 120K-word versions with 1 μsec cycle time while the "worst-case" cycle time on the add-on units is 750 nsec, according to Systems Concepts.

The 32K add-on unit costs $45,000, the 64K version costs $70,000 and the 128K model costs $120,000. Comparable DEC memories cost $50,000 and $80,000 for the 32K and 64K sizes. DEC does not offer a 128K version, according to Systems Concepts.

The add-on units include a data warning feature that enables a DEC KI-10 processor to overlap memory cycles under certain conditions, Systems Concepts said. Light-emitting diode indicators are used on the front panel of the add-on units for reliability.

First deliveries are scheduled for Nov. 15. Maintenance will be available at added cost. Systems Concepts is at 524 Second St., 94107.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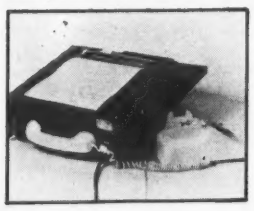

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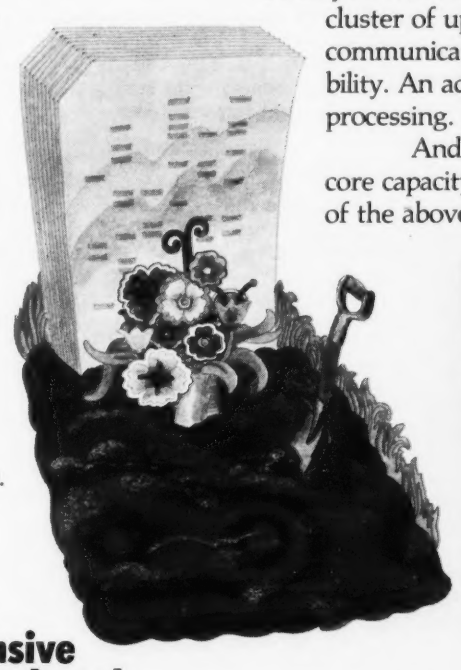

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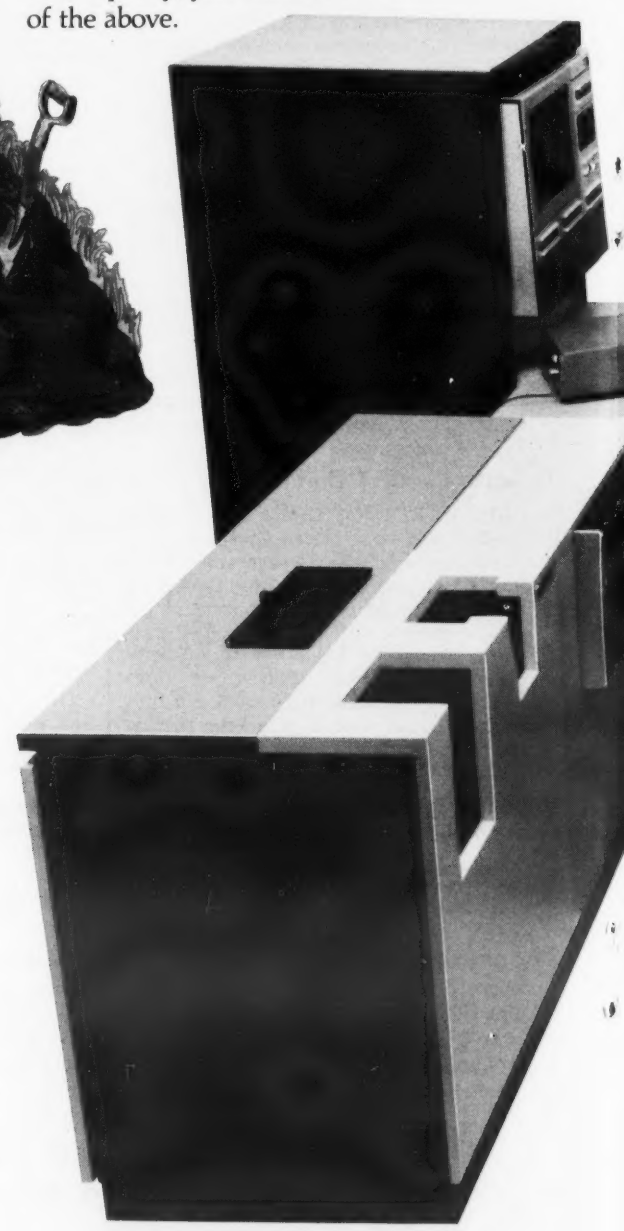

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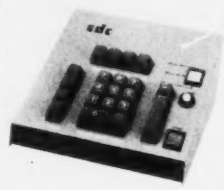


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## *Virtual Storage—Part I*

# 'New' Concepts Are Not Untried

By John Hunter and Dan Tanner
Special to Computerworld

PHILADELPHIA – The IBM S/370 Advanced Function (virtual storage) announcement encompasses hardware and software changes which will support the new direction charted for the 370, viz., virtual memory.

Virtual memory is neither new nor proven. RCA, Burroughs and CDC use it, and IBM employs it on the 360/67. All have experienced some problems.

Supporting the Advanced Function are enhanced facilities for the models 135, 145, 155 and some 165s to allow virtual memory operation; two new systems – models 158 and 168; four enhanced versions of old 360 operating systems; and a new file access method to replace Isam.

Conspicuous by omission from the announcement were the anticipated Model 125 and extension of the system enhancement to the Model 195.

**Virtual Storage**

The key to the 370 Advanced Functions is virtual storage, an old concept. The British first used it in the late 1950s on the Atlas Computer, and different forms are presently offered on the Univac Series 70 (nee RCA), Burroughs 500 and 700 Series, larger CDC systems and the 360/67.

Simply stated, virtual memory amounts to using a high-speed direct access device (disk or drum) as if it were an expanded main processor storage. With it, storage addresses up to the logical limit of the system's addressing structure (in the case of the 370, 16,777,216 bytes) can be directly used by programs independent of the actual size of the system's main storage.

**The IBM virtual storage announcement has many important implications for the user. This series will attempt to explain the operation of a virtual system and then assess its impact on the user's hardware and software.**

Of the techniques available to implement virtual storage, IBM has chosen the page concept.

Paging breaks the user's program into multiple fixed- and equal-size blocks (pages), which are stored on direct-access devices and brought into real memory as needed. Real memory is divided into frames corresponding to the size of a page frame.

The concept of a partition or memory region, as had existed under earlier IBM operating systems, now applies only to virtual memory space. There, pages belonging to a program are contiguous; in real memory, page locations are random, with the new operating system providing linkage.

**Three Advantages**

Three principal advantages are derived from paged virtual storage: programmers need no longer worry about program size, fitting an altered program into a partition, or modularizing a program and providing linkages between modules.

In short, the programmer, to quote IBM, "is freed to concentrate on the application."

And concentrate he must, for the overhead involved with virtual storage is high at best and horrendous at worst. This becomes quite evident when poorly laid-out programs must be constantly paged in and out of main storage.

**Technical Drawback**

The chief technical drawback of paged virtual storage involves such repetitive paging. In essence, a system could require page swaps between memory and virtual store at such a rate that it is overwhelmingly preoccupied with paging to the exclusion of useful work. This activity is called "thrashing."

IBM claims it prevents thrashing in three ways: by selection of a page size appropriate to the operating system; through the use of a priority scheduling algorithm that allows paging of only the highest-priority jobs in the event thrashing begins; and by allowing the user to select the most advantageous combination of CPU power, real storage size and device-type virtual storage.

**Adverse Effects**

Notably underplayed by IBM is the fact that the inclusion of virtual storage in a system is bound to have some adverse effect on performance, particularly due to the associated disk latencies and cycle-stealing losses.

These losses may well be of no consequence compared with the considerable improvements in overall equipment utilization that the new capabilities offer, but it will be interesting to see whether these inefficiencies lead to any disillusionment by users.

IBM, in stating that larger programs can be used prior to the addition of the extra memory needed, may be acknowledging that a problem exists, or it may be indicating a natural desire to upgrade existing installations.

*The authors are associate editors with Auerbach Computer Technology Reports.*

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## Ferguson on System 3

# Press Should Report IBM Actions More Objectively

By David E. Ferguson
Special to Computerworld

The age-old American tradition of rooting for the underdog is, I suppose, an essential ingredient of the Yankee ethos. We screamed for the dissolution of the baseball empires of John McGraw and Connie Mack. We carried banners demanding the breakup of the Yankees. And we shake our heads sorrowfully over the stranglehold UCLA has on college basketball.

And, of course, IBM is the arch enemy. The computer industry press, to a magazine, takes a broad swipe at IBM at every opportunity under the supposition that anti-IBM can be equated with pro-Lincoln, pro-mother and pro-dog.

As a matter of fact, I find this unified editorial stand quite amusing at times. The June edition of *Datamation* featured a section on small business computers which was quite complete, ranging alphabetically from Basic Four to Univac.

It was not until the end of the article that *Datamation* estimated that approximately 15,000 small businesses now utilize small computers and that more than 10,000 of these are represented by IBM System 3 models. Actually, the IBM figure is closer to 14,000 and the giant is shipping S/3s at the incredible rate of 35 a day!

Now, there is nothing wrong with journalistic integrity. Playing fair is part of the game of the press, but fair is not avoiding the obvious.

In any discussion of small business computers, the S/3 must stand out head and shoulders over the entire field. Within a very short time, the S/3 will have the largest single model population of any computer in the history of the industry with an estimated 40,000 installed internationally by the end of 1973. And there must be a reason.

### More Secure

In terms of the type of companies which have been buying small business computers, IBM actually provides a more secure solution in terms of service than any of the other manufacturers. This is the first computer experience for a vast majority of S/3 users and IBM appears to them to be a security blanket. Before I am drowned out by the laughter, I call your attention to the words "appears to them to be."

In addition, many S/3 users are really out there in the boondocks where a Cascade or Ultimacc would have a great deal of trouble providing service of any nature whatsoever.

Certainly, there are a number of extremely viable computer systems available to the small businessman. Burroughs and Honeywell will undoubtedly end up being IBM's biggest competitors in this marketplace.

Both companies not only build quality equipment but are bundled – which will give the two companies an edge in the software area at least. And both have nationwide service.

Still, I find the attitude of the press more than a little mystifying. The *Datamation* article, for instance, lists a firm with nine employees, with gross sales not announced and with sales and service located at the home office only.

Immediately above this listing is another company with 265,493 employees, corporate gross sales of $8,273,603,369 and sales and service offices in the U.S., Canada, Europe, Orient, South America, Africa and Australia.

Guess who.

But don't get me wrong. I am definitely not a proponent of size for size's sake. There are a lot of things wrong with IBM, but there are a lot of things right as well. We often fail to remember IBM was not the first company to get into the computer market. It saw a marketplace and attacked it with superb marketing and service.

We often forget that IBM gambled its entire corporate treasury in developing the 360 as the first third-generation computer. And IBM first identified the small business marketplace and developed the S/3, knowing full well it would eventually replace IBM's most popular computer to that date, the 360/20.

Those are the kinds of decisions which take real corporate guts. IBM knew it would have to compete in the small business market on an unbundled basis against companies which, legally, would be able to include their software within the price of their hardware package.

It knew it was jeopardizing the 360/20 which was renting from $4,000/mo on up by introducing a new computer which would rent for about $2,000/mo on the average.

The fact that the gambles paid off in no way diminishes the insight and courage of those gambles. It's about time that the computer press, therefore, stops trying to break up the Yankees and starts reporting IBM activities from an objective point of view.

After all, if it weren't for IBM, there wouldn't be much of a computer press at all.

*Ferguson is president of Group/3.*

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# Workable Rail System to Move Freight Cars Promised in Bill

WASHINGTON, D.C. – The House is currently studying a Senate-passed bill that would authorize up to $35 million for the development of a computer-based system to help the nation's railroads utilize freight cars more efficiently.

The act (S.1729), passed unanimously by the Senate, would authorize the secretary of transportation "to design a national rolling stock information system" and to help the railroads implement the system.

"Such a national rolling stock information system," the bill stated, "shall use computer and communication techniques and equipment which will facilitate equitable distribution and efficient and economical utilization of rolling stock."

The computer-based system would be designed to provide timely information about car location and status and would allow quick determination of the location of empty cars so they could be sent to shippers.

The measure would also allow for the rapid tracing of cars that have been lost or misplaced by the railroads, the bill's sponsors said.

"Freight car shortages have long been a recurring problem for the users of railroad transportation," according to Sen. Warren Magnuson (D-Wash.) during debate on the bill.

"As a result, grain is piled in the streets of midwestern towns, manufactured goods stack up on shippers' docks, vital coal supplies are diminished and lumber prices skyrocket."

"Improved car use is the key to solving the freight car shortage problem. It is also the key to revitalizing the weaker railroads," he stated.

Magnuson reported the average freight car is in movement only 12% of the time and "it is moving with a load only about 7% of the time; the rest of the time is empty movement. The average freight car moves loaded an average of only 32 miles a day," he said.

"It has been demonstrated," he continued, "that modern computer and communications technology, if properly put to use, could help improve utilization dramatically.

"The industry lacks the ability to locate cars and put them to work efficiently. On some occasions hundreds of cars and even whole trains have been misplaced," he charged.

### Design Cost

During the first year of the bill, $10 million would be available for the design of the system; in the second year another $15 million would be available for testing and aid in implementation to be followed by another $10 million in the third year.

If the railroads do not have a workable system by then, the Senate said it would establish a semi-public body to implement the national computerized rolling stock system.

The measure is now before the House Interstate and Foreign Commerce Committee.

## Students Won't Starve, But...

PHILADELPHIA – This fall students at the University of Pennsylvania will have to be content with just one meal per meal in the school's cafeterias.

To prevent students from getting extra meals and passing their meal tickets on to others, the school will use a computer to verify tickets.

The students will insert the plastic ID cards into the computer to be admitted into the dining halls. If the card has already been used during the mealtime, the computer will reject the card.


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# Picking Yacht Race Winner a Breeze

CHICAGO – A portable terminal and a time-shared computer are helping the Lake Michigan Yachting Association quickly determine winners in each racing class according to a handicapping system.

While most sailors pack food and sails in their car and head for the starting line, Roy Bowers of the Chicago Yacht Club puts an Itel 1051 terminal in his car and heads for the finish line.

**Ratings in Base**

The data base used by a Leasco Response computer in Chicago contains every racing yacht's assigned rating, usually an International Offshore Rule or Cruising Club of America rating, along with the boat's sale number, yacht number, owner or skipper, type of boat and racing class.

After receiving input on the actual distance of the race, sail numbers and finishing times, the terminal prints out the corrected results for the race.

It also provides the committee with a worksheet and automatically determines scratch boat – theoretically the fastest.

**Faster Results**

At this year's Mackinaw race 196 boats entered and 184 finished. Results were obtained in less than one hour, instead of three experienced race committee members working a total of 15 man-hours.

Bowers also has a program that estimates time of arrival for each boat in the long races, such as Chicago to Mackinac Island. These are produced following reports from Coast Guard air sweeps of the race.

With updated information fed to the terminal at 6:30 p.m. Sunday evening, the printout predicted the yacht Sassy would cross first at 3:05 a.m. Monday morning. Most of the unbelieving press and race committee went to bed. At 3:05 a.m., Sassy crossed the finish line.

## This Check Won't Bounce

WARWICK, R.I. – Bound to strike joy in the heart of man is the sight of a refund check on his state income tax. But not in the case of Sheldon P. Cohen, who, although surprised because he hadn't expected a refund, was disappointed when he found the state was generously paying him ***** dollars and 00 cents.

"What do I do with the check? Do I cash it for nothing? I hate to wait too long because then it will expire," he mused.

But the incident was not so humorous to tax officials. Between 100 and 200 of the useless computer-generated checks were mailed before the mistake was caught.

Milton T. Stone, a state revenue agent, admitted officials were afraid blank checks had been issued, in which case "we would have had to send men out to pick up every one of them."

But the bug in the computer generating checks when the balance was 0 has been fixed, and "the state has not had to pay anything it shouldn't have paid," affirmed John H. Norbert, state tax administrator.

## Students Find Cost of Education Getting Higher

HOUSTON – About 800 out-of-state students at the University of Houston were mistakenly sent increased tuition bills for the fall semester, and an operations error in the computer center was the culprit, according to comptroller Harold Scott.

Students who have been registered at the university continuously since spring of 1971 are billed at the old, lower tuition rate. The list of these students was loaded improperly, in the wrong sequence, and during the table lookup operation the program couldn't identify the list and ignored it while preparing fee slips, Scott explained.

As a result, these students were issued bills for the new, higher tuition. The university has about 27,000 students.

**File Corrected**

After the error was called to the school's attention, the university mailed a notice indicating the bills were erroneous, and corrected the file, he said.

A member of the registrar's staff said the goof involved a lot of extra paperwork. The staff had to check with the permanent records office to verify that the plaintiff was eligible for the lower rate, and also handle some rebates, since some of these students had paid the incorrect bills.

## Cab Checkups Coming

NEW YORK – A computer is playing a significant role in the plans of the New York City Taxi and Limousine Commission in assuming responsibility for inspecting the 12,500 cabs licensed by the commission.

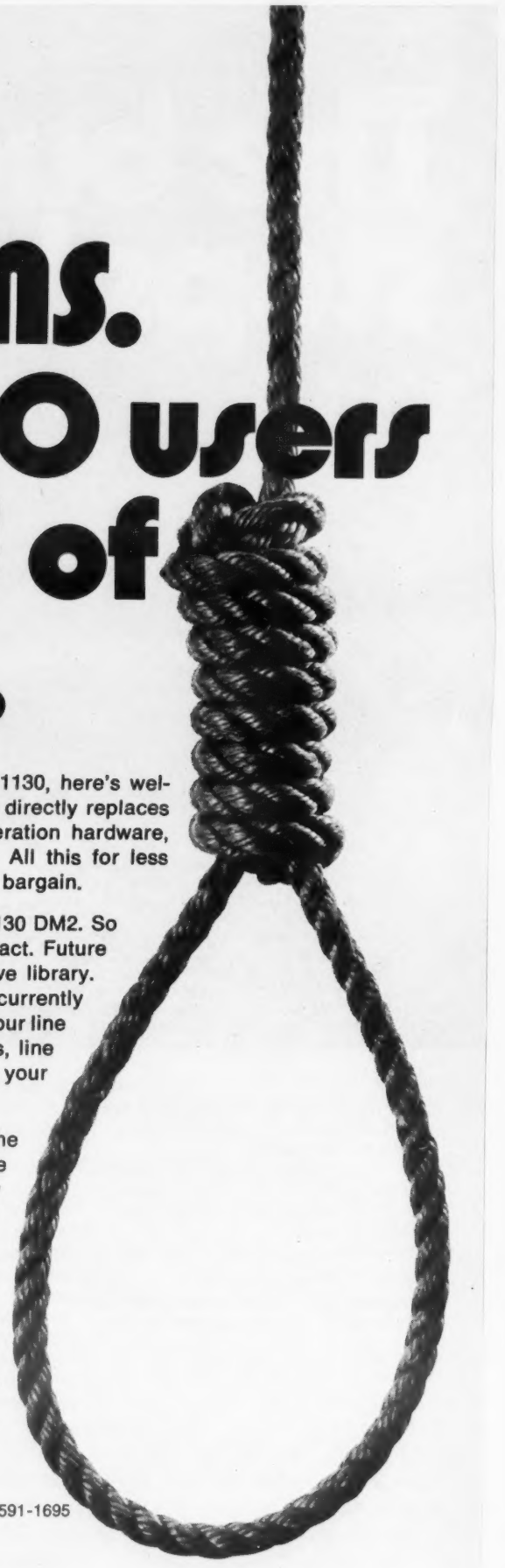
Currently, a few of the larger fleets are authorized to conduct their own inspections, and the rest of the cabs receive checkups similar to those given private autos.

The commission proposes to build an inspection station in Long Island City which will be organized into three production lines, each capable of handling one car every 17 minutes, a spokesman said. A computer will monitor emission analysis, safety and noise standards.

Printouts of appointment notices will be sent to cab owners four times a year, and a credentials check will be run on each cab entering the facility.

The plan is pending approval by the City Council.


# The GA DMS. For IBM 1130 users at the end of their rope.



If you're at the end of your rope with a throughput-bound IBM 1130, here's welcome news: General Automation's 18/30 Disk Monitor System directly replaces the 1130. With increased throughput, faster memory, 4th generation hardware, expandability, even real-time and communications capabilities. All this for less than you're paying for your 1130. It's a true price/performance bargain.

GA's 18/30 DMS operates directly with programs written for 1130 DM2. So all of your existing software and programming effort is left intact. Future programs are probably already waiting for you in our extensive library. And you'll probably get at least five times the throughput you are currently getting on your 1130. What's more, you'll be able to choose from our line of faster peripherals — like mag tapes, big disks, card readers, line printers and plotters. It all adds up to a system designed to suit your needs for years to come.

The 18/30's role as a superior, economical replacement for the 1130 is a field-proven fact. A General Automation representative will be glad to show you why dozens of customers have already switched to the 18/30 DMS, and what it can do for you. To find out, give him a call. We maintain offices with complete field service and technical support in principal cities in the United States and Europe. And we're growing by leaps and bounds.

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# DP Is Not Their Business, But It's All in the Works

By a CW Staff Writer

LODI, Calif. – "We are not in the data processing business – we're in the foundry business," but since the computer works, "I sleep nights."

The "man of iron" with this opinion was no man at all, but Vickie Van Steenberge, president of Lodi Iron Works.

The company's two plants produce 3,000 tons of castings a year, and use a small computer to provide customers with data on orders, among other applications.

Van Steenberge, mother of two, joined the Lodi foundry as a clerk after high school. Van Steenberge purchased the founder's major interest in the firm when he retired in 1963.

**More Competitive**

"In this highly competitive industry," Van Steenberge commented, "our real products are service and quality. The computer helps us compete more effectively" through timely information on costs of individual jobs, she said.

***The Small Systems User***

"We can spot the unprofitable jobs almost immediately," she added.

Vickie Van Steenberge checks customers' patterns.

The main advantage provided by the computer, she said, is the ability to reformat, analyze and report information which was previously posted to ledger cards.

Work in process, finished goods inventory and costing and profitability are the chief applications for this type of analysis.

**Tracking Orders**

Work in process is controlled by recording each order as it enters the office. A permanent record is created to track the order until it has been shipped, she said, providing an "open order file which is as current as yesterday's production."

From this file, two basic open order reports are created, one by due date, the other by customer, she said. The listing by due dates enables foremen to schedule departments and balance manpower, while the customer listing provides the status of each job for each customer.

Information on the customer file includes purchase order number, Lodi job number, pattern and metal used, the quantities ordered, shipped and on hand, date ordered and due date.

As an example of how this might assist a customer, Van Steenberge recalled that a customer recently called, requesting a pattern change in the middle of the job.

"Without leaving my desk, I was able to tell him that the castings had been made and he would have to accept them," she related.

Before putting this aspect of production control on the IBM S3/6, she would have had to go to the shipping department and check a card. If the information was not posted, she could have made an erroneous assumption that the castings were not made.

"Then Lodi would have been stuck with the cost of making useless castings," she said.

**Detailed Information**

Daily production reports inform management with detailed listings by the five metal types used, including production and scrap, by employee within each department.

"We know who was working on what, the day the job was done, the department he worked in, what he did and how many hours were involved and how much time has been used," she noted.

Periodic reports also inform foremen if they are running over estimates, so they can make necessary changes "in time to have some real effect," she continued.

Finished goods inventory is as important to a foundry as to other types of businesses, she indicated. While delaying the shipping of completed orders might not actually cost money, it would tie up funds and also display poor organization, she said.

This in turn could result in poor customer relations, lost customers, and then, lost revenue, she added.

Besides production and labor reports, the system helps Lodi adjust individual job costs more equitably.

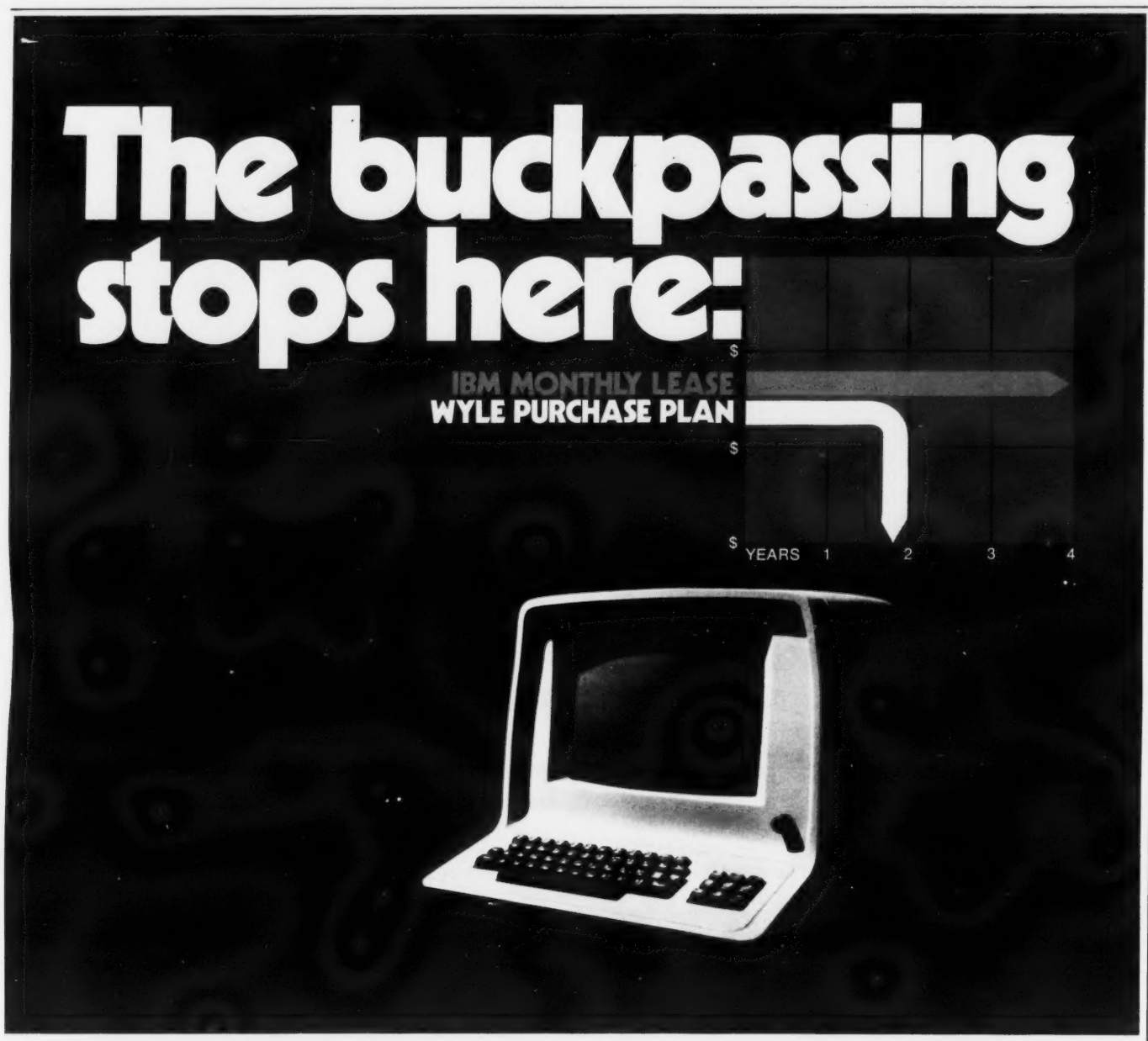
With a printout of all jobs, she can see whether the company made or lost money, and by what percentage, "so that when it comes time to determine new prices, I don't go straight across the board.

"I analyze each job. Maybe this job should be raised 10%, that one only 2%, or perhaps it shouldn't be raised at all," she continued.

With the printout at her fingertips, she can carefully review each job, she noted.

Other output includes documentation data, allowing her to analyze sales and to make forecasts, she said.

"In this manner, we believe we are being fair to the customer," she added. "We are not making all customers pay for the inefficiencies of a few jobs."


A 16 terminal IBM 2260 CRT system leases for about $2500 a month–from here to eternity.

If this same amount was used to lease/purchase a Wyle 8000 system, the buck passing would stop in less than two years!

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|---|---|
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| 64 | $120,000 |
| 128 | $240,000 |

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|---|---|---|
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| Los Angeles | Friday | October 20 |

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Mail to: David Sudkin, Program Chairman, International Data Corporation, 797 Washington Street, Newton, Mass. 02160

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# Heavy User Program Signals Change in 'Final' FJCC

By Edward J. Bride
Of the CW Staff

MONTVALE, N.J. – Growing user orientation continues to be the goal of the planning committee for the Fall Joint Computer Conference (FJCC), with 50% of the technical program slanted towards end users.

"Measurement of computers," one of the hottest user topics today, will be featured as one of seven divisions of the technical program, according to officials of the American Federation of Information Processing Societies (Afips), conference sponsors.

The fall meeting will be the last of the semiannual meetings, which will be replaced next year by the National Computer Conference (NCC) and Exposition.

### No Keynote

The committee for this fall meeting has apparently decided that attendees may be too busy to attend a keynote speech, and the tentative plan is to scrap the keynote session, Afips reported.

The 59 technical sessions begin at 8:30 a.m. on the first day of the meeting, and thus there may not be an available time slot for the traditional keynote speech, according to Afips.

The change is just one of many attempts to make this fall's meeting, Dec. 5-7, more relevant to the entire computer community, with emphasis on users, Afips has reported.

Besides the heavy emphasis on the technical program, there will be four adjunct seminars for users in specific areas: medicine and health care, banking, manufacturing and "information data centers" [CW, July 26].

These seminars, to be run concurrently, will not be held in the same facility as the rest of the conference – the Anaheim, Calif., Convention Center – but in the Disneyland convention complex, which one Afips source described as a "healthy walk away."

While Afips acknowledged that several hundred attendees to these seminars might be tempted to skip the technical program or the exhibits, this was called unlikely since registration will be held at the Anaheim Convention Center.

Preregistration would obviate the need to go to that facility, however. Afips said the type of person who might attend the user seminars would nonetheless be more interested in equipment exhibits than the usual high technology types.

### Carrying the Tradition?

While the FJCC will be the last to carry that name, next year's National Computer Conference and Exposition will carry on the Afips tradition of a national show for the computer community, Afips said.

This fall show is considered a transitional meeting, with the vertical user adjuncts slated to become a permanent part of the NCC.

Other steps which show an increasing attempt to relate the fall meeting to users, Afips noted, include devoting 50% of the conference program to "user requirements and major applications areas."

Six sessions, for example, will fall under the category of measurement of computer systems. The subjects will include executive viewpoint, system performance, software performance, useful approaches, techniques and applications and case studies, Afips said.

Donald Meier, technical program chairman, said the sessions were designed to provide the user of EDP systems with a "variety of tools for evaluating the performance of systems," and to help him evaluate those systems "which might best serve his specific needs."

Six other divisions of the technical program – besides measurement – include software, hardware, users and applications, interdisciplinary topics, systems and architecture and analysis and simulation, Afips said.

Afips is predicting that about 20,000 people will attend the conference, which would represent an increase of about 50% over previous recent meetings.

They are basing their optimism on increased orientation toward users, and on a return to a major metropolitan area as the conference site.

## Societies/ User Groups

## DP Solutions Shared With Common Hotline

CHICAGO – Common, the user group for those with small and medium-size IBM computers, is trying to broaden its influence in the DP community by instituting such new services as a hotline for immediate help with conversion problems.

Dr. Larry Baker, president, explained that once members have been through a conversion they are willing to provide advice to other members. He stressed that Common is not in the business of writing new systems, but simply of helping other members.

The group is also aiming for closer affiliation with local user groups, and assistance in organizing new groups, Baker noted.

Common's next meeting is at the Carillon Hotel in Miami Beach, Oct. 9-11.

The group recently established full-time headquarters facilities here.

## Calendar

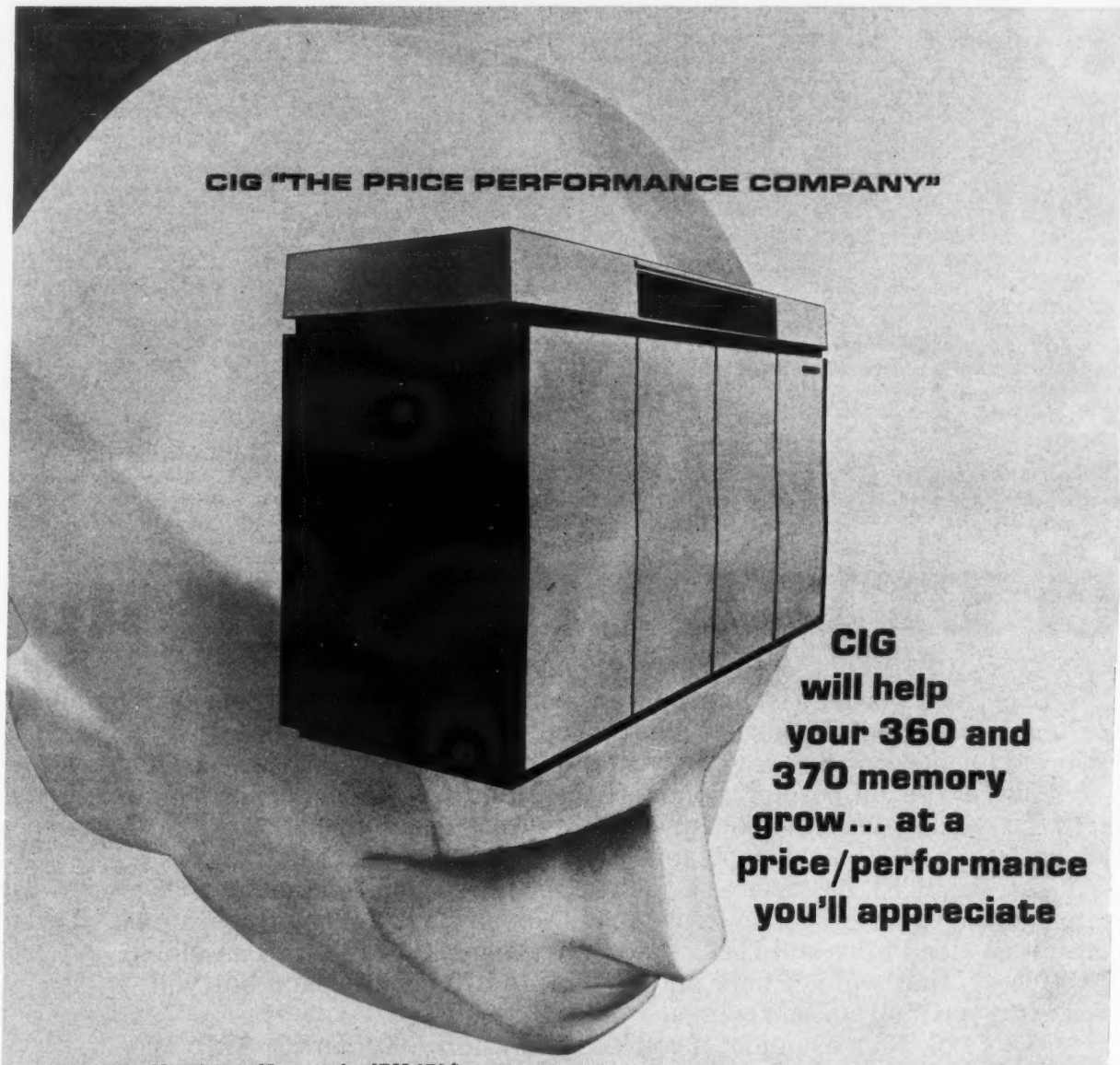
Oct. 16-17, New Orleans – **Digitronics Users Association.** Contact: Mort Siegelbaum, DUA, Box 33, Southboro, Mass. 01772.

Oct. 18-21, Philadelphia – **1972 Annual Meeting and Symposium of the Project Management Institute.** Contact: Project Management Institute, P.O. Box 43, Drexel Hill, Pa.

Oct. 24-26, Washington, D.C. – **International Conference on Computer Communications (ICCC-72),** sponsored by the IEEE Computer Society, IEEE Communications Society and ACM. Contact: 72 ICCC, 8728 Colesville Road, Silver Spring, Md. 20910.

Oct. 26-27, San Francisco – **Adapso's 36th Management Conference on "Meeting Your Profit Potential."** Contact: J.L. Dreyer, Adapso, 551 Fifth Ave., New York, N.Y. 10017.

Oct. 27, New York – **Seventh Annual ACM Urban Symposium.** Contact: Etelle Grinoch, Registration Chairman, Sperry Rand Corp., Sperry Gyroscope Division, Great Neck, N.Y. 11020.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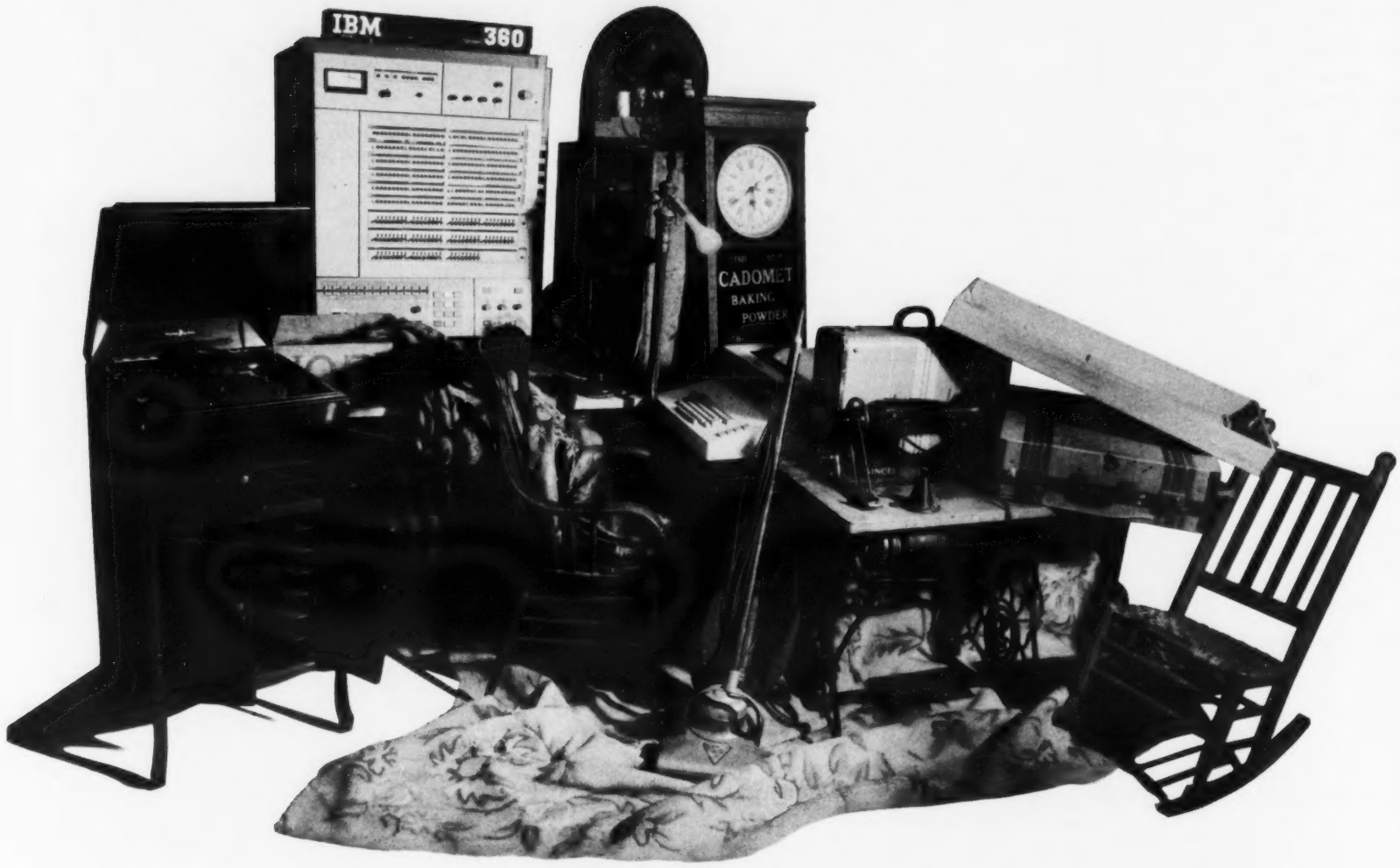


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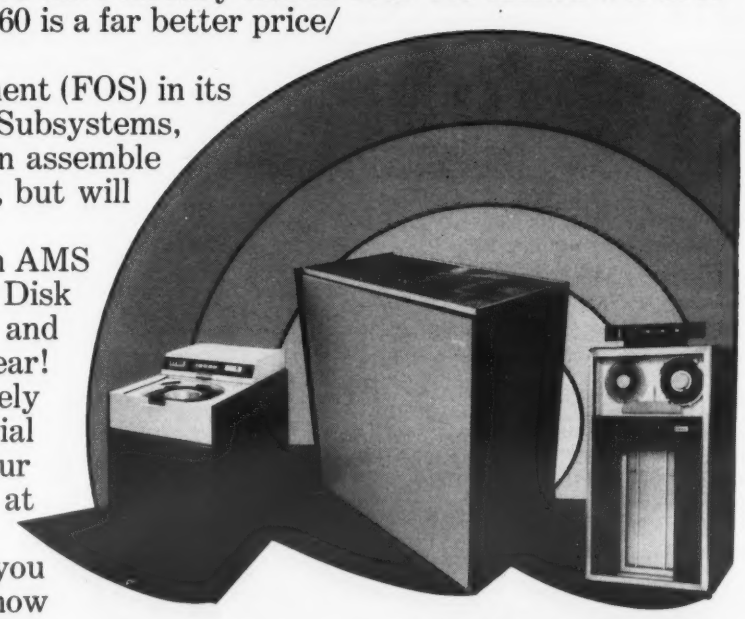

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## CI Notes

### 'Buy Japan DP' to Continue

TOKYO – Although the Japanese cabinet has revoked the nine-year-old "buy Japan" decree, the Ministry of Trade and Industry (Miti) said Japanese makers of DP equipment will still be given preferential treatment. The industry is still too weak to compete with foreign firms on an equal basis, Miti said.

The Japanese subsidiary of IBM is considered a Japanese company and qualifies for special consideration.

### CDC 3330 Unit Coming

MINNEAPOLIS – Control Data has acknowledged it is completing the development of a new plug-interchangeable disk storage subsystem that will be offered later this year as a replacement for the IBM 3330.

The Control Data disk storage subsystem is being designed for use with IBM 370 Series computers and with Model 85 and larger units of 360, the firm said.

### Wescon Plans 8 DP Sessions

LOS ANGELES – Eight full technical sessions at Wescon here this week (Sept. 19-22) will be devoted to computer-related topics, in addition to the rest of the program with more general subjects of interest to engineers and marketing men.

The session on parallel processing systems will cover the Illiac IV and Staran computers, while other sessions will cover "Electrically Alterable Nonvolatile Semiconductor Memories," "Computer Networks," "Magnetic Bubbles," "Digital Readouts," "Medical Electronics," "Trends in Data Communication Test Equipment," "Displays for the Minicomputer," "Trade Secrets" and "Design and Application of Microcomputers."

All sessions will be held in the convention center here, along with the display and exhibit area.

### Supershorts

Datum, Inc. has received notice from the General Services Administration of contract number GS-OOS-11271 covering the period July 1, 1972, through June 30, 1973, for magnetic tape input/output systems.

– – –

Computer Automation, Inc. has appointed Tranchant Electronique of Paris as the exclusive sales and distribution agency for Computer Automation products in France and selected countries in North Africa.

– – –

Tymshare, Inc. and Computer Complex, Inc. have entered into a new agreement in which Tymshare will purchase substantially all the assets and goodwill of Complex's computer time-sharing operations.

The agreement supersedes the agreement entered into between the two firms in August 1971.

## Monthly Maintenance Charges

# IBM Price Hikes Called Discriminatory

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Computer leasing companies, who already feel IBM pricing policies have hurt their businesses, have reacted strongly to the new higher Minimum Monthly Maintenance charges announced by IBM [CW, Sept. 13].

The group feels the new increases are discriminatory, because the rates for certain purchased units were raised, while the monthly maintenance for similar equipment rented from IBM was left unchanged.

In addition, the new, higher rates for field engineering services will affect purchase customers more than any other category, the group said.

"It seems inconsistent that IBM could increase maintenance charges on certain purchased equipment (such as that owned by our members) and not apply the same increase to equipment leased from IBM," according to Jim Benton, executive director of the Computer Lessors Association.

"The machines are identical and have always been under IBM maintenance," he noted, "so how can they discriminate between the two when it comes to setting new maintenance charges."

As an example of this alleged discrimination, industry officials pointed to the new Minimum Monthly Maintenance Charge on the 1403 N1 printer. The minimum, which is the amount charged to purchase customers, has been raised from $183/mo to $197/mo, he noted.

The Monthly Availability Charge, however, which is the amount charged to customers that rent directly from IBM, remains the same.

Other areas the lessors considered discriminatory were the new charges for the 2401, 2402 and 2415 tape drives, all of which now carry higher Minimum Monthly Maintenance charges for purchase customers but not for users who rent directly from IBM.

In fact, IBM customers will only have to pay higher monthly rates on MICR equipment, and not on any equipment used in more normal applications, the lessors said, while the purchase customers will have to pay higher rates on several items of equipment.

"I don't see how they can get away with this," one member of the leasing fraternity said last week.

"They said that the new rates were 'necessary because of the increased costs associated with these machines and services.' Are they saying that the costs of maintaining a purchased unit have increased while the costs for a rented unit have not? I can't believe that."

**'Blatant Discrimination'**

"This is blatant discrimination," another lessor said, "they cannot raise rates on purchased equipment and not on rented equipment without it being discriminatory.

"I guess that after the Greyhound lawsuit against IBM was dropped, they feel they can do anything they want and get away with it," he added.

"The move clearly violates the spirit and intent of the 1965 consent decree which IBM signed," another pointed out. "Even though that decree is not in effect any longer, IBM has said they would obey its spirit," he added.

To date, the Computer Lessors Association has protested the maintenance hike to IBM, Benton said, adding he did not know what further action might be taken.

"It all depends on their answer," he said.

An IBM spokesman indicated the Monthly Availability Charge, which is the total rental fee including maintenance, was not raised for these products because "the rental price reflects a broad range of things" and that maintenance was only one part of the price.

# Gap Widens Between Japanese DP And IBM With VS Announcement

By Dempa Publications, Japan

TOKYO – The latest IBM 370 announcements have caught Japanese computer manufacturers by surprise. The series with virtual memory has scored a one-upmanship point against three groups of Japanese computer makers who have been busily developing machines to challenge the 370.

Six Japanese computer makers formed into three groups (Fujitsu-Hitachi, Nichiden-Toshiba, Oki-Mitsubishi) to develop prototype systems under a government subsidy before free trade in computers opens up in two years.

The new generation "family series" was intended to compete with the IBM 370 and System/3 machines.

But with the announcement by IBM of the "new series," the makers have been thrown off their primary targets, the models 155 and 165. Moreover, the Models 135 and 145 are being equipped with virtual memories as standard, significantly boosting their cost/performance ratings.

Even before upgrading the 370, a wide price/performance gap existed between IBM and Japanese-made systems. Figures released by the Ministry of International Trade and Industry (Miti) in December of last year illustrate the gap.

If the IBM 370/165 is taken as having a price/performance ratio of 100, for example, the domestically made machine intended to challenge it rates a paltry 19. By the same token, the 155 at 100 sees the Japanese machine at 24; and the 145 at 100 shows the equivalent at 24.

This data has been criticized as politically motivated in opposition to free trade. But the fact that a gap exists is not contested. The gap has been widened further by the new IBM announcement.

**Only a Model Change**

Japanese makers are retaining their composure in regard to the new IBM series. They allude that it is simply a model change and the inclusion of the virtual memory is the only novelty.

According to some spokesmen, the adding of individual features does not represent a major breakthrough and IBM's reputation stems from its ability to coordinate a multitude of basically straight-forward components, rather than from sweeping innovations.

# Univac Unbundling Suit Dropped

By a CW Staff Writer

NEW YORK – An antitrust suit seeking to force Univac to unbundle its pricing of hardware, software and services has been dropped, and the plaintiff is now writing software for Univac, sources disclosed recently.

Neither company announced settlement of the lawsuit, filed two years ago here, although both Univac and On Line Software, Inc. said the litigation was "disposed of amicably."

On Line Software had charged Sperry Rand Corp., and specifically the Univac Division, with "deception" in combining the pricing of the software, hardware and "related services" necessary for installing computer systems.

On Line Software has since diversified from its former business of writing only Univac software; it now writes transaction control systems which operate under IBM's CICS, for example.

Jack Berdy, president of On Line Software, declined to discuss the suit further, other than to note that the fact it was no longer active was "public record."

The end result of the suit and the contract, then, appears to be further confirmation that Univac will remain "bundled." On Line had complained that a bundled marketing position was costing it business, so Univac has given the former plaintiff some contract work for the same type of software development.

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## Boom, Bust, Survival

# Software House Stages Comeback After Bankruptcy

By E. Drake Lundell Jr
Of the CW Staff

ATLANTA – Management Science America Inc., which came out of bankruptcy proceedings here recently, provides a very clear example of the problems that have plagued overly ambitious software houses over the past five years.

And this example has a happy ending – MSA is still in business after 18 months in bankruptcy – while many similar firms have not fared so well.

The firm sums up its past: "Like others of its ilk, MSA started small, grew too rapidly and raced towards financial disaster. By early 1971 it was some $9 million in debt and losing additional money every month with no tangible assets."

The firm was founded in 1963 by five Georgia Tech graduates and prospered moderately in its early days by doing consulting work largely for the textile industry.

In its first four years it grew slowly and by the end of 1967 had 46 employees and generated revenues of $981,000, or 5 cents per share.

Not bad, steady growth and profitability.

But then the bug bit – money was easy to come by and the firms which had the most ambitious plans for future expansion generated the most attention from the "fat cats" of the financial centers.

MSA developed a plan and sold 150,000 shares at $12 each, planning to use the $1.8 million to grow in other computer-related areas outside of its specialty in consulting.

### Big Plans

The plan for the firm envisioned the opening of 200 computer centers within one year in the U.S. and Europe and 12 consulting offices throughout the world. It also called for the development of 32 software packages to be marketed throughout the world.

The plan sounds almost foolish to veterans of the past four years of recession, but was a typical – if exaggerated – example of many of the plans being made in the middle to late 1960s by ambitious programmers and consultants, partly lured by the easy access to money.

To meet its plan, MSA grew to a staff of over 800 in six hectic months beginning in November 1968.

Needless to say, the $1.8 million went out fast – as well as an additional $3 million loan from the First National Bank of Atlanta.

From its base as a consulting company, MSA had become a software company, operating 20 computer service centers, a health services company, an advertising agency, a travel bureau, an operations research firm, an international consulting company with offices at five overseas sites and a personnel agency.

Hiring an average of 50 people a month almost surely requires an in-house personnel agency.

During the same time, Gulf Life Holding Co. let the firm increase its credit limits by another $3 million, raising its debt to $8.5 million in February of 1971.

But losses were also increasing. The firm lost $192,642 in 1968 on revenues of $2.7 million; $4.3 million in 1969 on sales of $9.3 million.

### Losses Mount

Then 1970 came and losses continued to mount while revenues dipped, a combination of the recession and the firm's overconfident expansion. The final figures showed a loss of $5.2 million on revenues of just over $6 million.

The firm was out of money. And the recession had dulled the image of the software houses. The backers were about to let the firm dissolve if something wasn't done fast.

John Imlay, then of University Computing Co., was called in to see whether the operation could be salvaged.

Tackling his "greatest challenge," Imlay planned to restructure the firm into just a software package seller and cut the other operations – except for research and development of future software packages.

He felt that if the firm were limited to this area alone, it would reasonably expect to turn a profit on revenues of around $3 million a year.

To implement the plan, he had to move swiftly to close down unprofitable operations – and in one day alone 218 people were fired without severance pay.

In one week – from March 1-6, 1971 – all other employees regarded as non-essential were discharged. From over 800 employees the firm had been trimmed to around 75 – in less than a month

### Bankruptcy Proceedings

After the cutbacks, the firm tried to secure agreements with its creditors that would keep it operating. But this was impossible, so the firm was forced to enter bankruptcy proceedings.

The cutbacks had had the desired effects. The new, smaller, less ambitious MSA made a profit each month for the next three months.

And the profits continued in the next quarter under protection of the bankruptcy laws. But creditor claims amounted to $3.6 million after the First National Bank of Atlanta and Gulf Life agreed to take equity in the new company in return for over $7.5 million in debt.

All the problems were finally resolved after a year of court proceedings and the company was allowed to come out of bankruptcy through a series of moves that now leaves it free of long-term debt.

MSA President John Imlay

"MSA's story is indeed remarkable," according to Larry Welke, president of the software section of the Association of Data Processing Service Organizations (Adapso).

"The management of its initial growth is typical, in a somewhat exaggerated way, of the kind of growth pains the industry went through when there was pie in the sky and no limits."

### 'Remarkable Recovery'

"Then, when so many companies were going under, MSA managed to hang on. And, when you consider that its salesmen were having to go out and sell to companies that knew MSA was bankrupt and that the odds were against MSA being able to service the packages it sold, you realize its marketing organization is truly amazing."

To Bernard Goldstein, president of Adapso, the MSA story illustrates a general turnaround in the service industry.

"The crisis has passed in the computer service industry – a crisis created by the period of overacceptance by the financial community in the late 1960s," he said. "The fever is down. Profits are up."


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*Japanese Minis*

# Competition Starts to Heat Up

By Dempa Publications, Japan

TOKYO – The bell has sounded for the second round in Japan's minicomputer competition. The first round was marked by the introduction of the so-called "first model" machines during 1969 and 1970.

The stage is now set for the "second model" entries, with Fujitsu's Facom/U200 leading the procession. Hitachi, Nichiden and other top-ranked makers are grooming their versions for unveiling before the end of the year. The contest has been further enlivened by the Okitac 4300C low-cost entry from Oki.

The second generation of minicomputers, boasting restructured architecture and price tags crowding the $3,200 region, is beginning to shift into high gear.

**Confusion Since '71**

The minicomputer field has been in a state of confusion since 1971. Price cuts have been rampant, with 20% to 30% reductions. In some cases, makers let the customer name the price. The business recession, marked by the selling of only 700 to 800 units, has been blamed for this situation.

But even during the international commercial slowdown, overseas minicomputer manufacturers have been successively introducing new models. Domestic makers are thus required to assume new equipment architectures to avoid getting lost in the competitive dust.

The Japanese makers who postponed new model introductions because of the business climate have acquired a more optimistic attitude after sales began showing signs of renewed activity recently.

Japan's minicomputer industry effectively began in February 1969 with the appearances of Hitachi's Hitac 10 and Fujitsu's Facom RC. These were followed later in the same year by Oki's Okitac 4300, Matsushita's MACC7 and Nichiden's NEAC1M4. These types have not changed appreciably in design, although the number of models has grown. The time is thus considered ripe to unveil new designs.

The Facom/U200 of Fujitsu was designed as a byte machine, while the firm's Facom R is a word machine. LSI memory, ROM and MSI are featured.

## Fujitsu, Oki Unveil New Models

By Dempa Publications, Japan

**TOKYO – Two Japanese mini makers – Fujitsu and Oki – have announced new machines.**

**Fujitsu has commenced its sales program for the Facom/U200 and peripheral equipment. This unit joins the Facom R, R/E and other systems in the Fujitsu minicomputer line. The firm has indicated its intention to market the U200 in parallel with the Facom R (word machine). Shipments are slated to begin after October.**

**The Facom/U200 employs a high-speed LSI memory and was developed for scientific calculation and control purposes. System cost is said to be three to five times less than previous systems.**

**Broad uses are seen for the Facom/U200 in universities and laboratories for research and testing, as industrial sensor based real-time control systems, in data communications and other fields. OEM marketing is also being considered.**

**Price with 8K-byte memory is $7,305, and with the 16K-byte memory, $9,253. Additional 8K-byte and 16K-byte memories can be installed.**

**Meanwhile, Oki Electric Industry has announced its Okitac 4300C, a new general-purpose minicomputer with improved performance (6 μsec cycle time) and reduced cost ($5,195 base price, 4K word, 16 bit/word). It is lower in cost than the previous low place holder, Toshiba's Tosbac 10E (8K-byte, 8-bit/word) priced at $6,261, or the DEC PDP-8/F (4-K words, 12-bit/word, 1.2 μsec recycle time) costing $6,358.**

**The Okitac 4300C is based on design concepts employed in the Okitac 4300S/E, which posted sales of 1,000 systems. Interchangeable software and peripheral equipment has already been developed.**

## *Foreign Orders & Installations*

The Swedish State Office has ordered a Univac 1110 system for the National Police Board. The system will be linked with two installed 1106s and 418 IIs at the central automobile registration agency, and will provide real-time access to crime reports, suspected persons, stolen cars, parking tickets, fingerprints and vital statistics.

**ZIT-Werk, a Bulgarian electronics instruments manufacturer, has ordered a Model 7900-11 flatbed plotting system and a Model 7180-B optical writing system from California Computer Products, Inc. ZIT-Werk will use the equipment to produce printed circuit artwork.**

The T. Eaton Co. and the F.W. Woolworth Co., Ltd. have installed the Pitney-Bowes-Alpex Spice point-of-sale systems in respective stores in Toronto and Agincourt, Canada.

**The British Post Office has ordered four Computer Machinery Corp. CMC 10 Key-processing systems valued at more than $875,000. The systems will be used to keep records of telecommunications service and apparatus.**

The Caisses Regionales du Credit Agricole Mutuel, a French cooperative bank, has ordered three Honeywell Model 6030 computer systems.

**The Manitoba Provincial Government has installed a Control Data Corp. 6500 system for a service bureau run by Phoenix Data Ltd.**

Queens University, Kingston, Ontario, has installed a Burroughs B 6700 dual-processor system valued at $2 million. The university's computer center operates as a service bureau, in addition to meeting university requirements.

**The Institute for Economic Research (IER) and the Institute for Advanced Studies, in Vienna, Austria, have jointly ordered a Univac 1106. The system will be used for macroeconomic conjuncture models of the Austrian economy and other economic tasks, and for the development of theoretical and empiric-statistical models. IER will link a remote Univac 9300, three display terminals and a plotter to the 1106.**

Kalle Anttila Oy, a Finnish mail order and department store company, has ordered 96 NCR 280 terminals, six NCR 723 data collectors and three NCR 747 tag printers for three of its department stores.


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# Marketing DP in Europe? Britain Not Recommended as Entry Point

By Reinhold P. Sell
Special to Computerworld

The computer markets in Europe have long been looked upon as natural extensions of the domestic market.

On the continent the country markets were largely developed and have always been dominated by U.S. companies; IBM sets the de facto standards and the umbrella is just as much in evidence there as in the U.S.

The UK, by contrast, does not fit this common mold – its computer market is distinctly British and differs significantly from all other markets in the West. The U.S.-based mainframe companies hold barely one half of the UK market and IBM is in the unaccustomed role of an "also-ran."

Starting from scratch in a new and foreign environment presents a rather more difficult set of problems than the opening of a new regional office on the West Coast or in Florida.

In most of Europe several problems revolve around as mundane a subject as language; other less visible but very vital differences exist in business mentality which, unless recognized and adjusted to, can easily spell the difference between success or failure.

Numerous new and young computer companies have already made the jump to Europe; only a few of them have been quite successful. Many more, however, show at best marginal results while still others have failed outright.

Many of the new concepts pioneered so successfully by the supplemental suppliers in their domestic U.S. market – third party leasing, plug-compatible peripherals and memories, time-sharing – have yet to catch on fully in Europe.

### England First?

Expansion to Europe invariably means the formation of a sales outlet in the UK, at least as the initial phase. This may or may not be followed up later by a further branchout to the continent.

On the surface this choice of the UK as the initial entry point looks like a natural and logical one, especially for relatively new and small companies with little or no prior international experience.

Major language problems do not exist and the general business environment is much more akin to the familiar domestic environment than is and will be the case in any of the continental countries.

The UK as a gateway to Europe may be strategically sound for most industries; but this is decidedly not the case for companies in any branch of the computer industry. At the very least, getting into Europe via the UK is the hard way to do it; at its worst, this move can mean outright disaster for a new and unseasoned international division.

The reasons are clear:

- The UK is one of the very few countries where local factors and locally based suppliers have created a uniquely local computer market environment.
- Elsewhere, the dominant position of the U.S. mainframe companies has resulted in a much more "Americanized" market.

## *Viewpoint*

- In the UK, IBM is in the unaccustomed position of an "also-ran" with barely one third of the market. This has obvious implications for all vendors who depend on the IBM base for their customers.
- Approximately half of all installed computer systems are owned either by their users or by British financial institutions.

Here again, the implications for those who largely depend on rental customers – leasing and replacement sales of plug-compatibles – are obvious. The effective market is simply much smaller than it appears on paper.

- In absolute terms, the UK computer market is the fourth largest after the U.S., Japan and Germany. However, the effective market – especially for those dependent on the IBM base – is substantially smaller than the absolute ranking may indicate.
- The UK market is the single most competitive country market in the world. Every U.S. supplier with any international operations competes not only with all the other U.S. suppliers but also with a large contingent of local British vendors.

The initial market entry into Europe presents enough problems under the best of circumstances; using the UK as the first entry point only compounds these problems.

The "international" marketing experience gained in such a move is of little value for any subsequent branchout to the large continental markets – if such a branchout is still in the cards after the expensive initial experience in the international arena.

*R.P. Sell is a business consultant in Natick, Mass., and was in Europe for six years in the DP industry.*

## *Contracts*

Computer Network Corp. has received a subcontract from Informatics Inc. to provide computer hardware and software capability to support the Toxicology Information Program's on-line search and retrieval service.

**Conrac Corp. has received a follow-on order from Computer Machinery Corp. for 2,500 additional CRT units.**

Computer Terminal Corp.'s Canadian distributor, TRW Communications, has received an order from the Canadian National Railway Co. for 149 Datapoint 2200 terminals and associated peripherals.

**Univac Division has received an $8 million contract to supply two 1108s, three 9200-IIs and one 9300 to the Army for use in logistical planning at the Radford, Va., arsenal.**

McDonnell Douglas Automation Co. has received a $97,800 contract to supply DP services for the Springfield, Ill., Public School District for one year.

**Computer Communications, Inc. has received a contract from the State of Tennessee's Department of Finance and Administration for a CCI-7000 communications processing system and a CC-70 computer communicator. The units will be used as the first part of a statewide on-line network.**

Control Data Corp. has been awarded a $2.5 million contract by the Washington Metropolitan Area Transit Authority to design the automatic fare collection system for the Capital area subway system.

**Cyphernetics Corp. has received a three-year contract from Michigan Bell Telephone Co. for time-sharing services.**

On-Line Systems, Inc. has obtained a three-year facilities management contract from Aluminum Co. of America to assemble and maintain a complete internal time-sharing system.

**Computer Products, Inc. has received a $30,000 contract from the National Aeronautics and Space Administration for RTP interface equipment.**

# 'Aggressive' Firm Profits From Diversification

By Marvin Smalheiser
Special to Computerworld

LOS ANGELES – Union America Computer (UC) is maximizing the use of its equipment and personnel by diversifying into facilities management, service bureau work, and a marketing effort with a terminal manufacturer.

UC, a sister company of Unionamerica Bank, sixth largest in the state, does a significant volume of work for the bank but has found a more efficient operation by diversifying into specialized, inter-related fields.

Sheldon Leachman, vice-president of marketing, said UC is doing twice the amount of work it was doing three-and-a-half years ago when it separated from the bank's data processing department. And the work is profitable, he said.

In facilities management alone it has a volume of over $5 million annually.

The company uses 210 people in a 24-hour-a-day operation that inlcudes two IBM 360/65s, a 360/50 and a 360/30, all on third-party leases and all with IBM maintenance. There are also numerous independent peripherals.

The first customer was Unionamerica Bank, about six months after the spinoff. There are now five major clients in banking, mortgages, education, retailing and insurance, all in Los Angeles.

The market, Leachman said, is only for the middle 20% to 30% of the total market of installed computers and, as far as UC is concerned, along the West Coast.

Also, UC's effort will be specialized since the company feels the growth in facilities management will be in specialized areas.

### 'Unique Criteria'

"The criteria for deciding on facilities management are unique for each case," Leachman said. "For every 10 cases we look at we make a proposal in only three to four. Generally, it has to be a 360/30 or larger for us to get involved."

If a contract is signed, Leachman said, the agreement has to involve a high level of respect and trust with responsibility clearly defined. And, always, there is a reversability clause.

"In facilities management, we try to get into a posture where a 20% savings is realized. On a long-term contract, we may wind up splitting that 20% with the client."

The original concept for UC was not facilities management but general service bureau work.

Today the service bureau's major effort is in mortgage banking.

Service bureau business has also been generated by systems and programming jobs on a fee basis – three to four of them a year.

"We'll do service bureau work only where we have proprietary software," Leachman said. "If we can't do it in a unique way, there is no sense in getting into the business. We look for unique, special applications, like mortgage banking."

Data entry, Leachman feels, is one of the most neglected areas of the computer industry. "Most of the talent is in new development, but in most installations 40% of the cost of running an installation is in data entry – people, equipment, cards and supplies."

Through its facilities management effort, UC generally has one or two major applications which are specialized and suited for an unusual data entry approach. For that reason, it uses three different types of data entry equipment – IBM 129s, Calcomp Punchmasters and the Computer Machinery Corp. CMC 5 Keyprocessing Systems.

A subsidiary, Computer Input Corp. (CIC), formed by Leachman and acquired by UC, also provides overseas keypunching in Taipei, Formosa. A contract signed recently with a state agency for keypunching 250,000 cards a month was the result of CIC marketing.

Another phase of UC's diversification is a joint marketing agreement with American Regitel Corp., San Carlos, Calif., which manufactures an electronic cash register and credit verifying system.

UC provides support services for the credit verification system at a department store chain, feeding information through the CMC 5 installation on site at the store's Long Beach headquarters.

UC's operations are at three sites.

The two 360/65s are at the downtown Los Angeles headquarters. The 360/50 is at another location on Wilshire Boulevard and the 360/30 is in Oakland. The Oakland computer became part of the operation after Unionamerica Bank acquired two banks in Northern California.

Leachman said UC has not been interested in IBM 370 computers. Rather, it feels it has a very good third-party contract that makes the 360s very economical.

"We make business considerations more important than prestige," he said. "We are not worried about being on the leading edge of technology unless it is feasible."

That philosophy also figures in UC's stance regarding independent peripherals. It has 30 Telex tape drives, 12 Calcomp disk drives and six Storage Technology tape drives.

UC likes the price/performance ratio of some of the independents and is "willing to take the risks of using independent peripherals" because "we have the know-how to handle problems that may develop. We know where the fault is likely to be if IBM and an independent try to blame each other."


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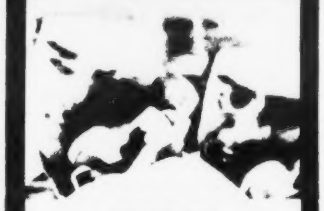

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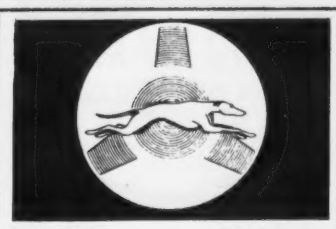

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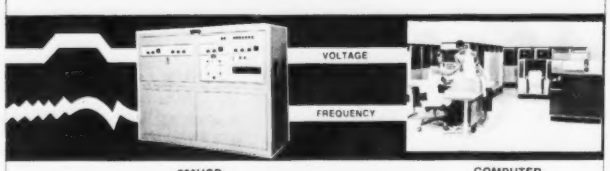


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*Revenues Climb*

# MAI Posts 3d-Period Loss

NEW YORK – An increase in revenues for the third consecutive quarter, some of it from new sources, has bolstered Management Assistance Inc.'s belief that its efforts to replace declining revenues from older equipment are succeeding, despite a $4.1 million loss in the third quarter ended June 30.

Revenues reached $13.1 million, a rise from $12.2 million in the 1971 period, when the firm registered earnings of $382,000, or 3 cents a share.

Rental revenues declined, to $8.6 million from $10.9 million a year ago, and MAI accelerated depreciation in the amount of $1.4 million.

Sales of the new Basic/Four system accounted for 18% of marketing revenues in the quarter, or almost $2 million, MAI said. Sales of the system are not included in the comparable year-ago period.

Revenues of Sorbus, the service subsidiary, doubled, to $1.9 million from $998,000 in the same 1971 quarter.

But increasing revenues were offset by the expenses incurred in the effort to "replace the declining rental revenues from equipment initially acquired in the 1960s," the firm said.

The buildup of revenues from the Basic/Four system continues to be slower than originally expected, the firm reiterated.

In addition, MAI has provided reserves relating to equipment held for rent by foreign subsidiaries in the amount of $720,000, as "it has become apparent that the technical advances previously experienced in the U.S. have now had a similar adverse impact on the foreign market for older equipment."

**Indebtedness Reduced**

On the brighter side, MAI managed to reduce domestic-secured indebtedness from $34.9 million as of September 1971 to $24 million as of August 1972.

Attainment of profitability hinges on continued expense controls, similar growth in Sorbus revenues, acceleration of orders and production of Basic/Four systems and the absence of significant writeoffs of equipment, MAI said.

"In summation, our older equipment has been both a blessing in producing cash flow enabling us to support our new programs and to reduce our debt obligations and a curse in its adverse effect on profitability by continuing to decline in each period," observed Raymond P. Kurshan, president.

## Leasco Arranges Loan For Two Subsidiaries

NEW YORK – Leasco Corp. has arranged for a $150 million revolving credit loan to expand its two leasing subsidiaries, Leasco Computer, Inc. and Leasco Europa, Ltd.

The agreement, completed with 46 domestic and international banks, will permit Leasco Computer to borrow $95 million on an unsecured basis for 18-month periods, renewable over a five-year term. All prior domestic leasing credits, which originally amounted to $193.5 million, have been converted to an unsecured basis.

## Anderson Jacobson Quarter Earnings Jump

SUNNYVALE, Calif. – Anderson Jacobson, Inc. has kicked off fiscal '73 on the right foot, with operating earnings for the first quarter ended June 30 more than double those of a year ago.

Operating earnings reached $50,818 or 2 cents a share, compared with $23,135, or 1 cent a share in the same quarter last year. Including an extraordinary item from the sale of land in Cupertino, earnings totaled $87,512.

Revenues climbed 45% to $1.2 million from $824,711 last year.

Lease and service income of $825,069 was up 76% compared with the first quarter last year, and 18% over the preceding quarter.

# New Registrations

MEGADATA COMPUTER AND COMMUNICATIONS CORP., 10 Evergreen Place, Deer Park, N.Y., data display equipment manufacturer, filed to register 150,000 shares of common. Proceeds, at $4 per share, intended for working capital. The underwriter is Abbott L. Glasser & Co., Inc., 120 Broadway, New York, N.Y. 10005.

PERIPHERAL EQUIPMENT CORP., 215 Little Falls Road, Fairfield, N.J., a company which plans to manufacture computer equipment, filed to register 150,000 shares of common. Proceeds, at $5 per share, intended for working capital. The underwriter is G.L. Equities Corp., 79 Wall St., New York, N.Y. 10005.

UNIVERSITY COMPUTING CO., 1500 UCC Tower, P.O. Box 6228, Dallas, Texas, a computer services and communications equipment firm, filed to register 108,962 shares of common.

MICRODATA CORP., 644 E. Young St., Santa Ana, Calif., minicomputer manufacturer, filed to register 300,000 shares of common. Proceeds, at $11 per share, to be used to expand manufacturing facilities. The underwriter is Harris, Upham & Co., Inc., 120 Broadway, New York, N.Y. 10005.

ADVANCED MICRO DEVICES, INC., 901 Thompson Place, Sunnyvale, Calif., integrated circuits manufacturer, filed to register 620,000 shares of common. Proceeds, at $17 per share, to be used to acquire additional equipment and for working capital. The underwriter is Donaldson, Lufkin & Jenrette Inc., 140 Broadway, New York, N.Y. 10005.

ELDORADO ELECTRODATA CORP., 601 Chalomar Road, Concord, Calif., small computer systems manufacturer, filed to register 222,000 shares of capital at $20 per share, and 78,100 shares of common. Proceeds to be used to retire bank loans and for working capital. The underwriter is Morgan, Olmstead, Kennedy & Gardner Inc., 606 S. Olice St., Los Angeles, Calif. 90014.

INFOREX INC., 21 North Ave., Burlington, Mass., data entry manufacturer, filed to register 500,000 shares of common. Proceeds, at $25 per share, to be used to repay bank debt and for new product development. The underwriter is Paine, Webber, Jackson & Curtis Inc., 140 Broadway, New York, N.Y. 10005.

DOCUTEL CORP., 2615 E. Grauwyler Road, Irving, Texas, manufacturer of automated financial and airline systems, filed to register 200,000 shares of common. Proceeds, at $37.25 per share, to be used to reduce short-term bank debts and for working capital. The underwriter is Dean Witter & Co. Inc., 45 Montgomery St., San Francisco, Calif., 94106.

COMDISCO, INC., 2200 E. Devon Ave., Des Plaines, Ill., broker in used IBM 360 systems, filed to register 200,000 shares of common. Proceeds, at $20 per share, intended for working capital. The underwriter is J. Shapiro & Co., 1740 Midwest Plaza Bldg., Minneapolis, Minn. 55402.

# Earnings Reports

**CSI COMPUTER SYSTEMS**
Three Months Ended May 31

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.08 | $.04 |
| Revenue | 824,467 | 748,509 |
| Tax Cred | 17,000 | 10,500 |
| Earnings | 55,924 | 31,596 |

**TYMSHARE**
Six Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.11 | $.08 |
| Revenue | 7,282,943 | 5,958,809 |
| Tax Cred | 153,000 | 110,000 |
| Earnings | 335,351 | 228,750 |

**WANG LABORATORIES**
Year Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.77 | $.93 |
| Revenue | 39,048,987 | 36,731,133 |
| Earnings | 3,103,635 | 3,720,552 |
| 3 Mo Shr | .27 | .40 |
| Revenue | 12,938,284 | 11,805,696 |
| Earnings | 1,100,321 | 1,621,378 |

**COMTEN**
Six Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.02 | $(.30) |
| Revenue | 3,092,593 | 3,412,189 |
| Earnings | 41,347 | (463,483) |

**INFORMATICS**
Three Months Ended June 24

| | 1972 | a1971 |
|---|---|---|
| Shr Ernd | $.08 | $.03 |
| Revenue | 4,532,000 | 4,599,000 |
| Loss Disc Op | ..... | 57,000 |
| Earnings | 115,000 | 48,000 |

a-Restated to reflect discontinued operations.

**COMDISCO**
Nine Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.40 | $.18 |
| Revenue | 10,297,144 | 3,655,738 |
| Earnings | 404,483 | 111,166 |

**DPF**
Year Ended May 31

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | ..... | $1.37 |
| Revenue | $42,324,000 | 47,958,000 |
| Spec Chg | ..... | 448,000 |
| Earnings | a(34,744,000) | 5,515,000 |

a-Includes additional charge of $42,350,000 reflecting change in depreciation method.

**METRIDATA COMPUTING**
Three Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.23 | $.14 |
| Revenue | 985,000 | 660,000 |
| Tax Cred | 34,000 | 25,000 |
| Earnings | 85,000 | 50,000 |
| 6 Mo Shr | .44 | .25 |
| Revenue | 1,749,000 | 1,299,000 |
| Tax Cred | 64,000 | 37,000 |
| Earnings | 159,000 | 90,000 |

**ELECTRONIC DATA SYSTEMS**
Year Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.105 | $.89 |
| Revenue | 90,954,821 | 75,225,749 |
| Earnings | 12,603,326 | 10,670,745 |

**DELTA DATA SYSTEMS**
Year Ended March 31

| | 1972 | 1971 |
|---|---|---|
| Revenue | $1,411,753 | $971,013 |
| Loss | 726,255 | 1,395,972 |

**ROCKWOOD COMPUTER**
Three Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.05 | $.23 |
| Revenue | 12,280,791 | 12,388,078 |
| Spec Item | a75,683 | b220,890 |
| Earnings | 231,917 | 754,842 |

a-Debit; includes $264,269 loss on sale of assets, gains of $147,295 on repurchase of debentures and $41,291 from utilization of capital loss carryforward. b-Credit; includes gains of $175,890 on repurchase of debentures and $45,000 from utilization of capital loss carryforward.


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TRADE*QUOTES

# Computerworld Stock Trading Summary

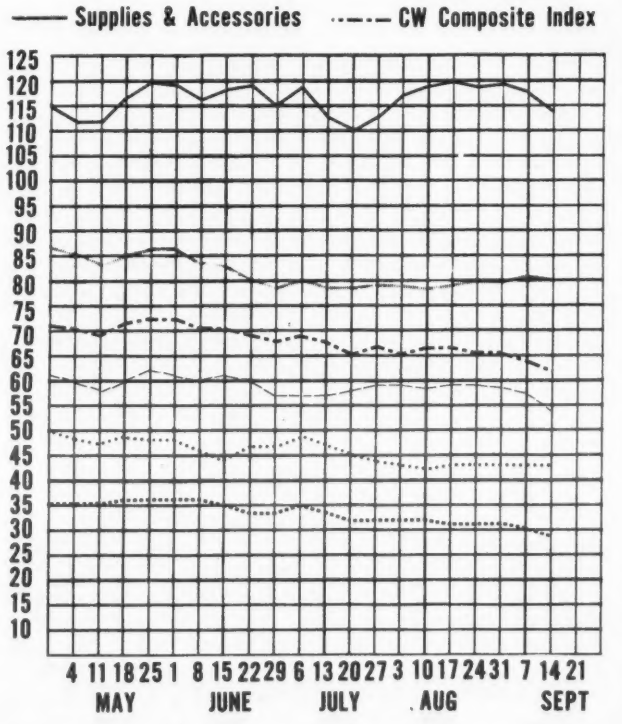
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, SEPTEMBER 14, 1972

| EXCH | | 1972 RANGE (1) | CLOSE SEP 14 1972 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| | **SOFTWARE & EDP SERVICES** | | | | |
| O | ADVANCED COMP TECH | 1- 3 | 2 3/4 | + 1/8 | +4.7 |
| A | APPLIED DATA RES. | 4- 7 | 5 | + 1/2 | +11.1 |
| O | APPLIED LOGIC | 1- 4 | 2 1/2 | 0 | 0.0 |
| N | AUTOMATIC DATA PROC | 72- 99 | 87 7/8 | -1 1/4 | -1.4 |
| O | BRANDON APPLIED SYST | 1- 2 | 1 1/8 | 0 | 0.0 |
| O | COMPUTER DIMENSIONS | 6- 14 | 6 1/2 | 0 | 0.0 |
| O | COMPUTER DYNAMICS | 1- 4 | 1 | - 1/4 | -20.0 |
| O | COMPUTER NETWORK | 4- 7 | 5 1/2 | - 1/8 | -2.2 |
| N | COMPUTER SCIENCES | 6- 10 | 5 1/2 | - 1/2 | -8.3 |
| O | COMPUTER TASK GROUP | 1- 2 | 1 | 0 | 0.0 |
| O | COMPUTER TECHNOLOGY | 4- 8 | 4 | - 1/4 | -5.8 |
| O | COMPUTER USAGE | 7- 14 | 7 7/8 | + 1/2 | +6.7 |
| O | COMP AUTOMOT REPORTS | 5- 9 | 5 | - 1/4 | -4.7 |
| N | COMPUTING & SOFTWARE | 14- 28 | 14 1/2 | - 1/8 | -0.8 |
| O | COMRESS | 1- 3 | 1 3/8 | - 1/8 | -8.3 |
| O | COMSHARE | 5- 10 | 6 3/8 | - 3/8 | -5.5 |
| O | DATATAB | 5- 9 | 4 3/4 | - 1/8 | -2.5 |
| O | EDP RESOURCES | 3- 8 | 3 | - 1/4 | -7.6 |
| A | ELECT COMP PROG | 2- 5 | 1 7/8 | - 1/4 | -11.7 |
| N | ELECTRONIC DATA SYS. | 43- 65 | 51 7/8 | -2 1/2 | -4.5 |
| O | INFORMATICS | 6- 11 | 5 1/2 | - 7/8 | -13.7 |
| O | I.O.A. DATA CORP | 1- 3 | 1 1/4 | - 1/4 | -16.6 |
| O | KEANE ASSOCIATES | 4- 7 | 4 3/4 | + 1/4 | +5.5 |
| O | KEYDATA CORP | 7- 13 | 12 | 0 | 0.0 |
| O | LOGICON | 4- 9 | 5 1/2 | 0 | 0.0 |
| A | MANAGEMENT DATA | 5- 10 | 5 | - 3/8 | -6.9 |
| O | NATIONAL CSS INC | 8- 28 | 25 5/8 | -1 3/8 | -5.0 |
| O | NATIONAL INFO SRVCS | 2- 5 | 1 7/8 | + 1/8 | +7.1 |
| P | ON LINE SYSTEMS INC | 8- 20 | 19 | + 1/8 | +0.6 |
| N | PLANNING RESEARCH | 9- 17 | 9 1/8 | -1 3/8 | -13.0 |
| O | PROGRAMMING METHODS | 20- 24 | N/A | -22 | -100.0 |
| O | PROGRAMMING & SYS | 1- 2 | 1 1/8 | 0 | 0.0 |
| O | RAPIDATA INC | 5- 25 | 22 1/2 | - 1/2 | -2.1 |
| O | SCIENTIFIC COMPUTERS | 2- 4 | 2 | - 1/8 | -5.8 |
| O | SIMPLICITY COMPUTER | 1- 5 | 3 7/8 | + 1/8 | +3.3 |
| O | TBS COMPUTER CENTERS | 4- 6 | 4 1/2 | 0 | 0.0 |
| O | TCC INC | 1- 3 | 1 1/4 | 0 | 0.0 |
| O | TYMSHARE INC | 7- 11 | 7 3/4 | -1 1/4 | -13.8 |
| O | UNITED DATA CENTER | 5- 8 | 6 1/4 | + 1/4 | +4.1 |
| N | UNIVERSITY COMPUTING | 13- 26 | 12 5/8 | - 3/8 | -2.8 |
| A | URS SYSTEMS | 6- 10 | 8 1/2 | + 3/8 | +4.6 |
| | **PERIPHERALS & SUBSYSTEMS** | | | | |
| N | ADDRESSOGRAPH-MULT | 34- 49 | 41 1/2 | - 1/8 | -0.3 |
| O | ADVANCED MEMORY SYS | 12- 23 | 14 1/4 | -1 1/2 | -9.5 |
| N | AMPEX CORP | 6- 15 | 6 1/8 | - 1/4 | -3.9 |
| O | ANDERSON JACOBSON | 5- 8 | 4 3/8 | - 1/4 | -5.4 |
| O | ATLANTIC TECHNOLOGY | 1- 11 | 5/8 | - 3/8 | -37.5 |
| O | BEEHIVE MEDICAL ELEC | 1- 5 | 3 1/4 | + 1/4 | +8.3 |
| A | BOLT,BERANEK & NEW | 5- 21 | 18 1/4 | + 1/2 | +2.8 |
| N | BUNKER-RAMO | 9- 14 | 10 1/8 | - 1/2 | -4.7 |
| A | CALCOMP | 11- 25 | 11 1/8 | - 7/8 | -7.2 |
| O | CAMBRIDGE MEMORIES | 9- 15 | 11 3/8 | -1 1/4 | -9.9 |
| O | CENTRONICS DATA COMP | 11- 53 | 47 | - 1/2 | -1.0 |
| O | COGNITRONICS | 2- 5 | 2 3/8 | - 5/8 | -20.8 |
| O | COMPUTER COMMUN. | 1- 7 | 2 1/4 | - 1/8 | -5.2 |
| A | COMPUTER EQUIPMENT | 3- 4 | 2 3/4 | + 1/8 | +4.7 |
| O | COMPUTER MACHINERY | 7- 13 | 9 1/8 | - 3/4 | -7.5 |
| A | COMPUTEST | 4- 9 | 4 3/8 | - 1/8 | -2.7 |
| A | DATA PRODUCTS CORP | 3- 7 | 3 3/4 | - 1/8 | -3.2 |
| O | DATA RECOGNITION | 1- 5 | 1 1/4 | 0 | 0.0 |
| O | DATA TECHNOLOGY | 2- 5 | 2 5/8 | 0 | 0.0 |
| O | DI/AN CONTROLS | 0- 8 | 4 3/4 | - 1/8 | -2.5 |
| N | ELECTRONIC M & M | 4- 8 | 3 3/4 | - 1/4 | -6.2 |
| O | FABRI-TEK | 2- 5 | 3 | 0 | 0.0 |
| O | GENERAL COMPUTER SYS | 7- 16 | 9 3/4 | - 1/2 | -4.8 |
| N | GENERAL ELECTRIC | 59- 70 | 65 | -1 3/4 | -2.6 |
| N | HAZELTINE CORP | 8- 13 | 8 1/4 | - 3/8 | -4.3 |
| O | INFOREX INC | 20- 36 | 20 | -1 | -4.7 |
| O | INFORMATION DISPLAYS | 1- 5 | 2 7/8 | 0 | 0.0 |
| A | LUNDY ELECTRONICS | 9- 14 | 10 1/8 | - 1/4 | -2.4 |
| O | MANAGEMENT ASSIST | 1- 2 | 3/8 | 0 | 0.0 |
| N | MEMOREX | 16- 38 | 16 1/4 | - 5/8 | -3.7 |
| A | MILGO ELECTRONICS | 17- 44 | 24 1/2 | - 1/2 | -2.0 |
| N | MOHAWK DATA SCI | 14- 27 | 15 1/2 | +1 | +6.8 |
| O | OPTICAL SCANNING | 7- 16 | 9 1/2 | -1 1/4 | -11.6 |
| O | PERTEC CORP | 8- 17 | 8 3/4 | - 7/8 | -9.0 |
| O | PHOTON | 7- 15 | 8 3/8 | - 1/8 | -1.4 |
| A | POTTER INSTRUMENT | 8- 21 | 8 3/8 | - 3/4 | -8.2 |
| O | PRECISION INST. | 4- 13 | 5 1/4 | -1 | -16.0 |
| O | RECOGNITION EQUIP | 8- 15 | 7 1/2 | - 1/8 | -1.6 |
| N | SANDERS ASSOCIATES | 13- 21 | 14 5/8 | - 1/2 | -3.3 |
| O | SCAN DATA | 7- 13 | 7 3/4 | - 1/4 | -3.1 |
| O | STORAGE TECHNOLOGY | 17- 39 | 29 | -1 3/8 | -4.5 |
| O | SYCOR INC | 7- 11 | 9 3/4 | -1 | -9.3 |
| O | TALLY CORP. | 8- 15 | 10 | - 1/4 | -2.4 |
| N | TEKTRONIX INC | 34- 64 | 53 1/8 | -2 1/4 | -4.0 |
| N | TELEX | 6- 15 | 7 | - 1/2 | -6.6 |
| O | WILTEK INC | 10- 26 | 18 | +1 | +5.8 |
| | **SUPPLIES & ACCESSORIES** | | | | |
| O | BALTIMORE BUS FORMS | 6- 9 | 7 | + 1/4 | +3.7 |
| A | BARRY WRIGHT | 9- 14 | 11 5/8 | - 7/8 | -7.0 |
| A | DATA DOCUMENTS | 17- 26 | 20 | - 1/4 | -1.2 |
| O | DUPLEX PRODUCTS INC | 8- 16 | 8 1/4 | - 1/2 | -5.7 |
| N | ENNIS BUS. FORMS | 7- 10 | 6 3/4 | + 1/8 | +1.8 |
| O | GRAHAM MAGNETICS | 15- 27 | 18 5/8 | - 7/8 | -4.4 |
| O | GRAPHIC CONTROLS | 12- 15 | 12 1/2 | + 1/2 | +4.1 |
| N | 3M COMPANY | 76- 85 | 79 1/8 | - 1/2 | -0.6 |
| O | MOORE CORP LTD | 42- 56 | 52 | -1 5/8 | -3.0 |
| N | NASHUA CORP | 48- 62 | 56 1/2 | -3 5/8 | -6.0 |
| O | REYNOLDS & REYNOLD | 37- 77 | 41 3/4 | -2 | -4.5 |
| O | STANDARD REGISTER | 14- 20 | 17 1/8 | + 1/8 | +0.7 |
| O | TAB PRODUCTS CO | 14- 21 | 21 1/4 | +1 1/4 | +6.2 |
| N | UARCO | 22- 28 | 21 7/8 | + 1/8 | +0.5 |
| A | WABASH MAGNETICS | 7- 11 | 7 1/8 | - 1/2 | -6.5 |
| N | WALLACE BUS FORMS | 22- 26 | 22 3/4 | + 1/4 | +1.1 |
| | **COMPUTER SYSTEMS** | | | | |
| N | BURROUGHS CORP | 147-226 | 206 1/2 | -3 | -1.4 |
| N | COLLINS RADIO | 14- 20 | 14 5/8 | - 1/4 | -1.6 |
| N | CONTROL DATA CORP | 43- 78 | 71 3/8 | -1 1/4 | -1.7 |
| O | DATA GENERAL CORP | 56-115 | 98 1/2 | -2 1/2 | -2.4 |
| O | DIGITAL COMP CONTROL | 9- 25 | 12 1/4 | + 3/4 | +6.5 |
| N | DIGITAL EQUIPMENT | 72-101 | 89 1/4 | -1 1/4 | -1.3 |
| N | ELECTRONIC ASSOC. | 6- 13 | 8 5/8 | -1 | -10.3 |
| A | ELECTRONIC ENGINEER. | 7- 14 | 6 3/4 | 0 | 0.0 |
| N | FOXBORO | 26- 41 | 27 1/8 | - 7/8 | -3.1 |
| O | GENERAL AUTOMATION | 13- 38 | 32 3/4 | -3 3/4 | -10.2 |
| O | GRI COMPUTER CORP | 3- 5 | 3 3/4 | - 1/2 | -11.7 |
| N | HEWLETT-PACKARD CO | 46- 77 | 67 1/8 | -1 | -1.4 |
| N | HONEYWELL INC | 130-170 | 145 3/4 | -5 1/4 | -3.4 |
| N | IBM | 333-426 | 399 1/2 | 0 | 0.0 |
| O | INTERDATA INC | 8- 16 | 11 1/8 | - 5/8 | -5.3 |
| O | MICRODATA CORP | 5- 10 | 8 | - 1/4 | -3.0 |
| N | NCR | 29- 37 | 36 1/8 | -1 1/8 | -3.0 |
| N | RAYTHEON CO | 29- 47 | 30 1/2 | - 5/8 | -2.0 |
| N | SPERRY RAND | 30- 48 | 43 | + 1/8 | +0.2 |
| A | SYSTEMS ENG. LABS | 10- 16 | 10 1/8 | - 1/8 | -1.2 |
| N | VARIAN ASSOCIATES | 14- 22 | 19 3/4 | -2 | -9.1 |
| N | VICTOR COMPTOMETER | 15- 24 | 19 | + 1/2 | +2.7 |
| N | WANG LABS. | 34- 61 | 33 7/8 | -2 5/8 | -7.1 |
| N | XEROX CORP | 121-172 | 153 1/8 | -1 1/8 | -0.7 |
| | **LEASING COMPANIES** | | | | |
| A | BOOTHE COMPUTER | 5- 18 | 5 1/8 | - 1/4 | -4.6 |
| O | BRESNAHAN COMP. | 2- 3 | 2 | 0 | 0.0 |
| O | COMDISCO INC | 3- 18 | 13 1/2 | -2 1/2 | -15.6 |
| O | COMMERCE GROUP CORP | 5- 11 | 6 7/8 | - 1/4 | -3.5 |
| O | COMPUTER EXCHANGE | 1- 3 | 1 1/8 | 0 | 0.0 |
| A | COMPUTER INVSTRS GRP | 8- 14 | 9 | + 1/8 | +1.4 |
| N | DPF INC | 5- 13 | 5 7/8 | + 1/8 | +2.1 |
| M | DATRONIC RENTAL | 2- 4 | 1 7/8 | + 1/8 | +7.1 |
| A | DCL INC | 5- 10 | 5 1/4 | - 1/4 | -4.5 |
| A | DEARBORN-STORM | 16- 26 | 17 1/2 | + 1/8 | +0.7 |
| A | DPA, INC. | 5- 8 | 6 1/8 | + 1/4 | +4.2 |
| A | GRANITE MGT | 5- 11 | 6 5/8 | +1 1/8 | +20.4 |
| A | GREYHOUND COMPUTER | 6- 11 | 6 1/8 | - 1/4 | -3.9 |
| A | ITEL | 7- 12 | 8 1/8 | 0 | 0.0 |
| N | LEASCO CORP | 17- 24 | 19 1/4 | - 5/8 | -3.1 |
| O | LEASPAC CORP | 9- 15 | 8 3/4 | -1 1/4 | -12.5 |
| O | LECTRO MGT INC | 1- 4 | 2 3/8 | + 1/2 | +26.6 |
| A | ROCKWOOD COMPUTER | 2- 7 | 2 5/8 | - 1/8 | -4.5 |
| O | SYSTEMS CAPITAL | 3- 20 | 13 3/4 | -1 5/8 | -10.5 |
| N | U.S. LEASING | 19- 33 | 31 | + 1/8 | +0.4 |

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

## Computer Stocks Trading Index


Computer Systems
Software & EDP Services
Peripherals & Subsytems
Leasing Companies
Supplies & Accessories
CW Composite Index
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10
4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21
MAY JUNE JULY AUG SEPT

## Earnings Reports

**ITEL**
Three Months Ended June 30

| | 1972 | a1971 |
|---|---|---|
| Shr Ernd | ..... | $.15 |
| Revenue | $20,141,000 | 27,801,000 |
| Loss Disc Op | ..... | 1,312,000 |
| Loss | 1,273,000 | 1,075,000 |
| 6 Mo Shr | ..... | .45 |
| Revenue | 39,585,000 | 55,548,000 |
| Loss Disc Op | ..... | 2,263,000 |
| Earnings | (2,800,000) | 3,203,000 |

a-Restated.

**MILGO ELECTRONIC**
Three Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.36 | $.09 |
| Revenue | 3,480,000 | 2,347,000 |
| Earnings | 571,000 | 140,000 |
| 9 Mo Shr | .89 | ..... |
| Revenue | 8,944,000 | 6,241,000 |
| Earnings | 1,422,000 | (93,000) |

**APPLIED DATA RESEARCH**
Three Months Ended June 30

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.08 | ..... |
| aRevenue | 2,352,074 | $1,351,846 |
| Disc Op | (9,620) | 11,710 |
| bSpec Cred | 31,720 | 53,716 |
| Earnings | 80,513 | (164,856) |
| 6 Mo Shr | .10 | ..... |
| aRevenue | 4,368,531 | 2,874,070 |
| Loss Disc Op | 12,969 | 39,345 |
| bSpec Cred | 31,720 | 53,716 |
| Earnings | 94,103 | (310,062) |

a-From continuing operations. b-Gain on the partial redemption of convertible debentures.

**DATACRAFT**
Year Ended May 26

| | 1972 | 1971 |
|---|---|---|
| Shr Ernd | $.12 | ..... |
| Revenue | 6,364,000 | $4,538,321 |
| Spec Item | a62,000 | d3,740,744 |
| Earnings | 158,956 | (4,595,647) |

a-Credit. d-Debit; from writedown of investment.

**CONTROL DATA**
Three Months Ended June 30

| | 1972 | a1971 |
|---|---|---|
| Shr Rend | $1.21 | $.86 |
| Revenue | 164,806,000 | 141,101,000 |
| Spec Item | c308,000 | d182,000 |
| Earnings | 18,009,000 | 12,935,000 |
| 6 Mo Shr | 1.95 | 1.74 |
| Revenue | 292,527,000 | 282,108,000 |
| Spec Cred | 818,000 | 446,000 |
| Earnings | 29,056,000 | 26,011,000 |

a-Restated. c-Credit. d-Charge.

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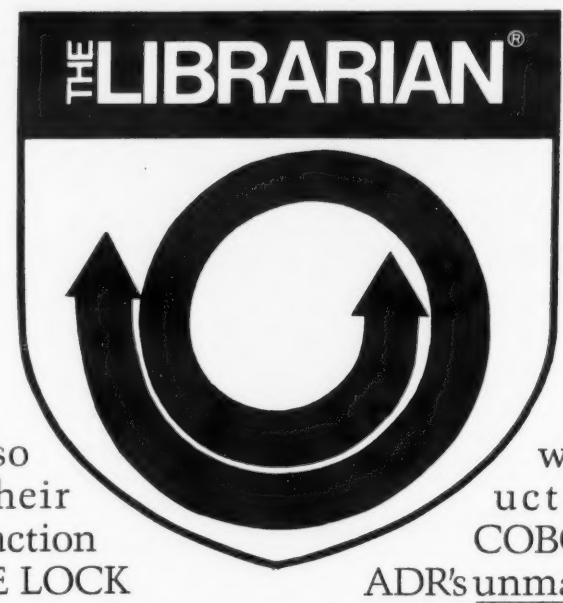


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